December 2, 1961
Vol. 161 — No. 23

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

U.S. Army Signal R&D Lab is testing Laser light for its communications usages. The Laser (short for Light Amplification by Stimulated Emission of Radiation) produces a pencil-thin beam of ruby-red light which stays in a thin shaft over great distances instead of widening out as ordinary light does. Pictured operating testing device, Sp6 Eugene Medcalf. Story on page 96.

Circulation This Issue
17,034 of Which
13,878 Is Paid

FALL CONSTRUCTION ISSUE

MANAGEMENT · PLANT · TRAFFIC · COMMERCIAL · LEGAL · ACCOUNTING

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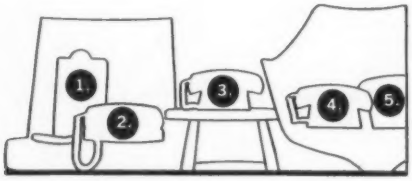

1. The 1553-W: this slim, trim wall model is just right for many home and business installations. There's no smarter telephone and none more versatile, especially where space is a problem.

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GD

GENERAL DYNAMICS | TELECOMMUNICATION

FLASHES AND PLUGS

TROUBLE CLEARING BIG TROUBLE. The world loves a lover, and many times, the telephone has cinched romantic contracts or smoothed a stormy path.

In the instance of Marjorie and Jack, two lovers about to be wed in Detroit, Mich., there was evidently a misunderstanding, for Jack tried to reach Marjorie by telephone, she tried to trace him by telephone, and her family received calls all day from a man who may have been Jack, but they still couldn't get together. Then, the question arose, Where had Jack gone?

It seems, Jack, a red-headed divinity student from Harbor Springs, Mich., took the bus to Detroit to become a salesman and to meet Marjorie, but he did not know Marjorie, a nurse, had gotten a job in a hospital in Pontiac. Anyhow, he arrived in Detroit on Friday, and she expected him on Sunday. Apparently, he tried all day by telephone to find her.

When she learned from her sister-in-law of the calls, she spent $20 of her own on calls—to places where she thought he might be. She even lost 10 pounds in the interval.

As a last straw, Marjorie went to the police, but they wouldn't help her because she was not a member of Jack's family.

At this point, she avowed, "But if I find him, the next day, I'll be a member of the family, all right."

•

BRITISH POTPOURRI. The struggle to meet telephone needs in Britain has known many complications, though the Government Post Office has recently reported telephonic communications progress as more encouraging. However, some ironies exist, to irk, or amuse, the British people.

For example, the Royal society in London will soon be ready to relay telephone conversations around the world by bouncing signals off soaring satellites, but the society has been unable to get a regular, earth-type telephone for its own local use! The GPO says the society is "halfway down a long waiting list."

While some may wait for telephones, visitors in London have, since 1958, gotten excellent service by dialing ASK-9211. Nearly 600,000 times, the recorded voice has given out up-to-date information of interest to tourists.

Prince Charles, who has just turned 13, and is living the "average" life of an English schoolboy, received telephone calls on his birthday from Queen Elizabeth and Prince Philip, who were visiting Ghana at the time. Charles, it is reported, looks forward to long pants and the privilege of watching late evening TV shows.

Whatever deprivation the British may feel about waiting for telephones, they still enjoy a chuckle. "Punch," the humor magazine, reports there is a new note of abruptness in polite British conversations, now that the Fleet Street exchange has gone on the subscriber trunk dialing system.

Where before Fleet Street subscribers might have talked like this: "Hello, Joanne, darling, if you're clued up on Somervell and Ross, I'd like to send you a marvelous new book about them for you to review for us" . . . now, they can say simply, "If upclued Somervell Etross, sending marvellousest new book reviewwise."

Change of Address

Please notify your local postmaster and the Circulation Department of TELEPHONY (608 S. Dearborn St., Chicago 5, Ill.) of change of address. Change cannot be made without the old as well as the new address. Allow three weeks for change of address to become effective.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

1901 — 60 years — 1961

December 2, 1961

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H. D. FARGO JR., *President and Director of Advertising* • A. J. STULTS, *Vice President and Advertising Manager* • R. C. RENO, *Vice President and Editor* • DAN S. FARGO, *Vice President and Managing Editor* • DIANNE P. DRUCKER, *Associate Editor* • HELEN HARDIN, *Associate Editor* • LAWRENCE J. HOGAN, *Washington Editor* • RAY BLAIN, *Technical Editorial Director* • PAUL E. MURPHY, *Electronics Editor* • MAYME WORKMAN, *Traffic Editor* • VIVIAN RYDEN, *Circulation Manager*.

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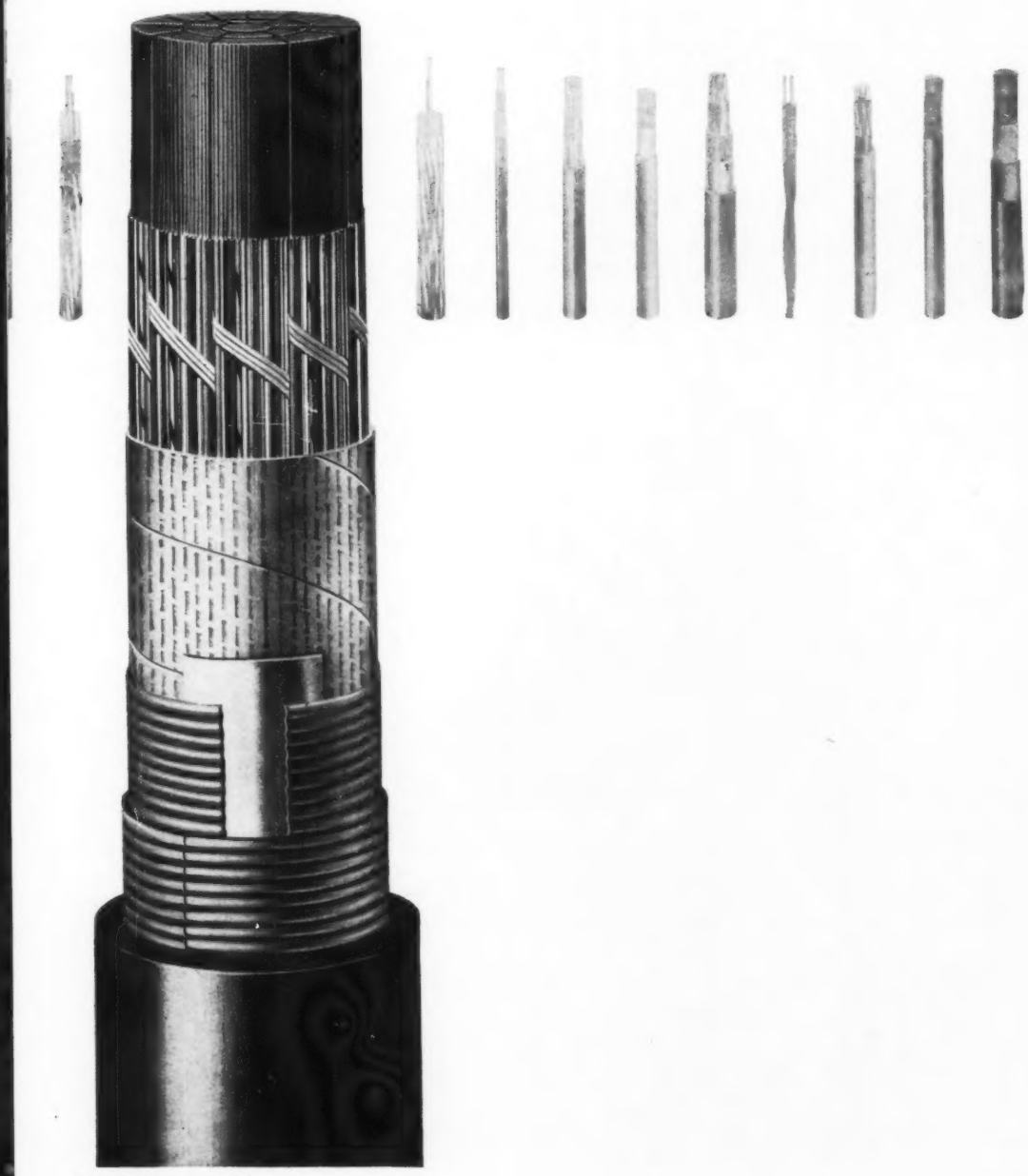

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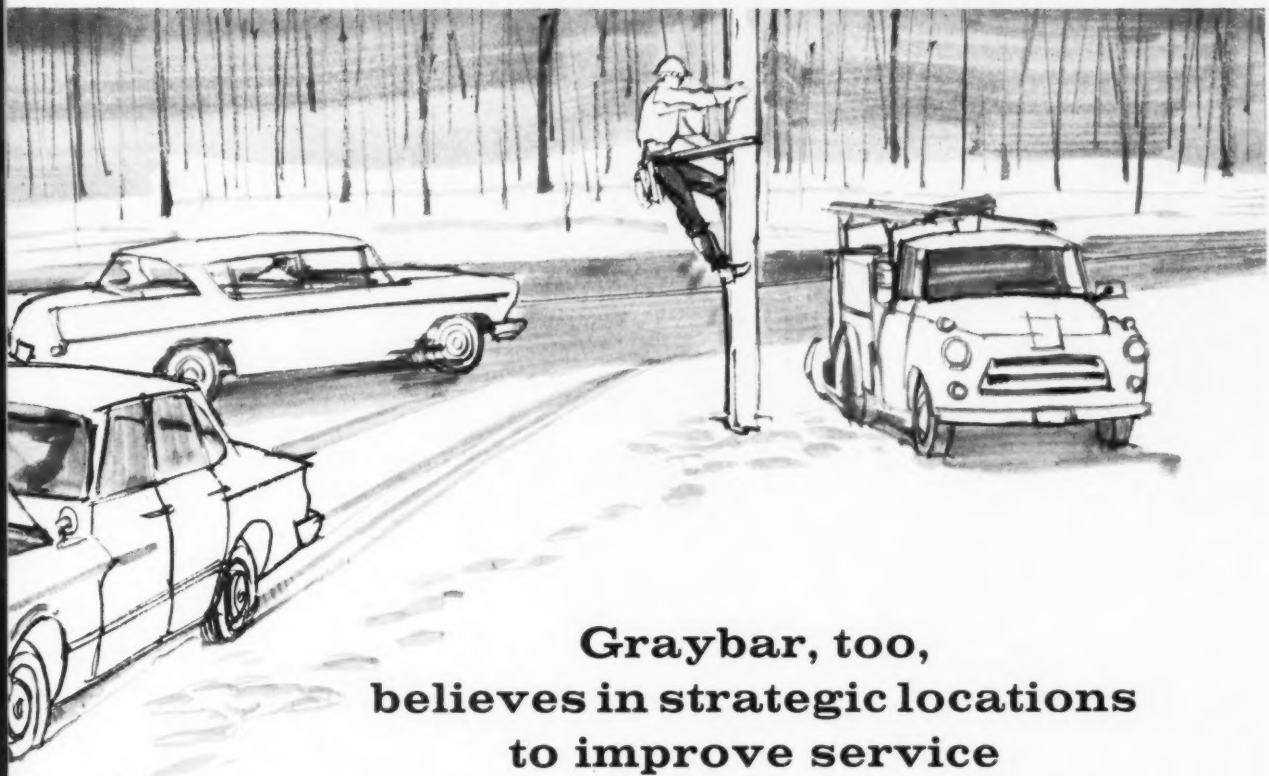

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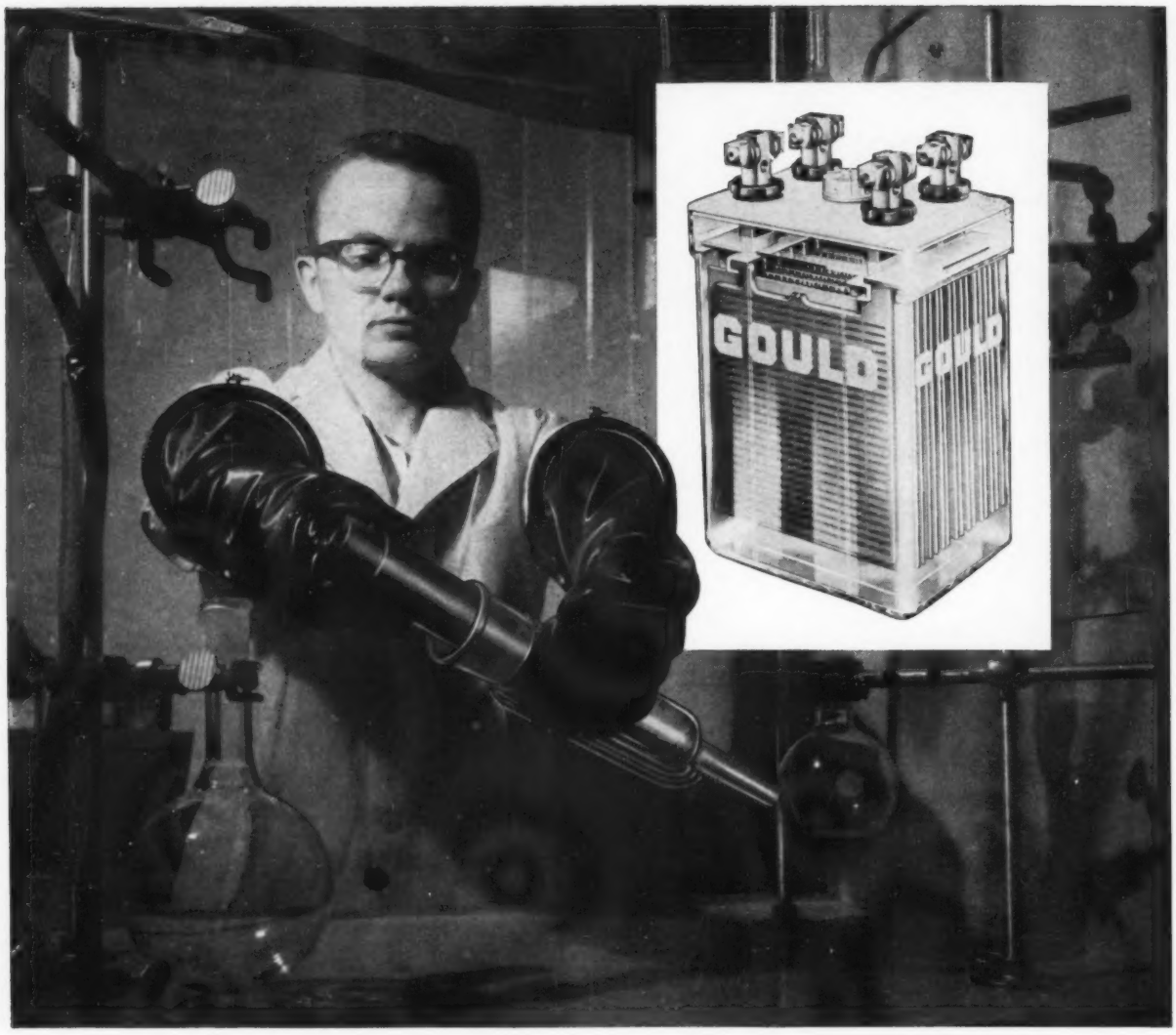

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IN THE NATION'S CAPITAL

BY LAWRENCE J. HOGAN, WASHINGTON EDITOR
and President, Larry Hogan Associates,
Public Relations Firm.

Bell offers special rates for educational TV. . . .This traffic forecast as important private-line service offering by Independent as well as Bell companies. FCC urges ultra-high TV frequencies. Pay-TV case postponed. Nine nations form space satellite organization. Kennedy commitment for special unit to look after consumer welfare explored.

EDUCATIONAL TELEVISION, which has since its inception been struggling with financial difficulties, got a boost from the Bell System in the form of a schedule of special interconnection rates which was submitted to the FCC.

Unless the schedule is protested by interested parties—primarily commercial television stations which pay a higher rate—or suspended by the FCC, the rates will go into effect on Dec. 7.

The TV networks have not officially taken a position on the rates, but one anonymous network authority was quoted in *Broadcasting* magazine as claiming that commercial broadcasters should have the right to use the service on the same rates and conditions as the educational stations. "Nobody wants to stand in the way of educational television," he said, "but I don't see how AT&T can offer one class of service to one group without making it available to all. The service AT&T proposes for the educational stations is not good enough for long-haul commercial networks, but it is perfectly good enough for short-haul hookups, and if commercial stations want to use it on that basis, I can't see why AT&T shouldn't permit it."

The decision as to whether AT&T can restrict the use of the new service to educational stations is, of course, up to FCC, but there is ample precedent for special service to specialized users such as government and press subscribers. Anything which helps to make educational TV more economically feasible should, and no doubt will, get the FCC's wholehearted support.

Bell officials have explained that the service being offered to educational broadcasters is not the same as is offered to commercial broadcasters. It's a stripped-down version which the regular broadcasters would not desire to use. The special service includes no monitoring, switching, special supervision, or the availability of a standby circuit, all of which are considered essential in commercial operations.

AT&T's Southern Bell Telephone & Telegraph Co. is already providing interconnection facilities for a statewide educational television system in South Carolina which serves 67 schools in 21 counties and its Chesapeake & Potomac Telephone Co. provides service to 44 schools in the Washington County, Md. school system.

The proposed rates provide for a monthly charge of $27.50 per air mile for a single video-audio channel for a full 24 hours between locations over 25 miles apart. For local service, where two connections are less than 25 miles apart, the monthly educational rate is $15 per quarter mile. Commercial intercity rates are $35 per air mile for a video-only channel for the first eight hours of use. Local rates are $20 per quarter mile for the same service.

The monthly rate for the new local service is divided into two categories:

For connections between buildings on the same premises, the charge per tenth of a mile is $6.00 for the first channel, $2.00 for the second channel, $1.20 for the third and fourth channels, and 80 cents for the fifth and sixth channels.

For separate premises less than 25 miles apart, the charge per quarter mile is $15 for the first channel, $5.00 for the second channel, $3.00 for the third and fourth channels and $2.00 for the fifth and sixth channels. Extra costs include: charges for channel input equipment (per signal source), channel output equipment (per receiving location) and outlet connections (per receiving location). For channel input equipment the monthly charge runs $40 for the first channel, $30 for the second channel, $25 for the third and fourth channels and $12.50 for the fifth and sixth channels. For channel output equipment, the charges are $7.50 for the first channel and $5.00 each for the second to sixth channels. Outlet connections, which are optional, are at the rate of $15 for a distribution amplifier and $1.25 for each outlet.

For connections over 25 miles the rates are on an air-mile basis. The monthly charges are $27.50 for the first channel, $12.50 each for the second and third channels and $10 each for the fourth and fifth channels. To this is added $8.00 monthly for channel output suppression arrangements and $12.50 for a channel output at a receiving location. Both the last two charges are optional.

Telephone companies recognize the rich business opportunities inherent in the educational television field through use of closed circuits coaxial cable. This traffic could become one of the important privateline services offered by telephone companies. In addition to AT&T, Independent companies are also interested in this new line of business, as evidenced by the "open circuit" method of simultaneous transmission of separate programs to specified classrooms now being offered by the Rock Hill (S. C.) Telephone Co. Representatives of the South Carolina Independent Telephone Association recently talked to REA officials in Washington about possible REA financing of such service.

FCC Pushes Ultra-High TV Frequencies

FCC Chairman Minow has said that TV manufacturers may be required to adapt their sets to use the ultra-high-frequency channels which are now being "wasted." Minow said it is urgent that the ultra-high channels be made available to all because many programs, including those by numerous educational TV stations, are now being broadcast over the high-frequency channels. At the present time, an adapter can be installed to present sets for $20-$30.

Pay Television Case Postponed

The U. S. Court of Appeals for the District of Columbia Circuit, which was scheduled to hear arguments in the Hartford, Conn., pay television case on Nov. 9, postponed the case until Dec. 1 following the death of the mother of one of the lawyers involved.

The Connecticut Committee Against Pay TV, which represents theater owners in the Hartford area, is attempting to reverse the Federal Communications Commission's 1960 decision authorizing RKO General, Inc. to operate a Phonevision pay television system for three years over WHCT-TV in Hartford.

Convention Calendar

1962

Association	*Date*	*City*	*Hotel*
Minnesota	**Feb. 25, 26, 27 and 28**	**Minneapolis**	**Radisson**
Louisiana	**Feb. 28; Mar. 1**	**New Orleans**	**Monteleone**
Kentucky	**Mar. 6**	**Lexington**	**Phoenix**
Texas	**Mar. 11, 12 and 13**	**Dallas**	**Sheraton-Dallas**
Iowa	**Mar. 19 and 20**	**Cedar Rapids**	**Roosevelt**
Ohio	**Apr. 3 and 4**	**Columbus**	**Deshler Hilton**
Nebraska	**Apr. 18 and 19**	**Omaha**	**Sheraton-Fontenelle**
Wisconsin	**May 8 and 9**	**Milwaukee**	**Plankinton**
Indiana	**May 9 and 10**	**Indianapolis**	**Claypool**
Kansas-Missouri*	**May 21 and 22**	**Kansas City, Kan.**	**Town House**
Illinois	**May 24 and 25**	**Springfield**	**Abraham Lincoln**
Pennsylvania	**June 4, 5 and 6**	**Bedford**	**Bedford Springs**
New York	**June 11, 12 and 13**	**Whiteface**	**White Face Inn on Lake Placid**
California	**June 13 and 14**	**San Francisco**	**Jack Tar**
Washington-Oregon*	**June 21 and 22**	**Portland, Ore.**	**Sheraton**
Michigan	**Sept. 18, 19 and 20**	**Lansing**	**Jack Tar**
Rocky Mountain	**Sept. 19, 20 and 21**	**Salt Lake City, Utah**	**Utah Hotel Motor Lodge**
New England	**Oct. 1, 2 and 3**	**Poland, Me.**	**Poland Spring Hotel**
USITA	**Oct. 22, 23, and 24**	**Chicago**	**Conrad Hilton**
Oklahoma	**Nov. 14 and 15**	**Oklahoma City**	**Skirvin**

***Joint meeting**

Economy-Minded

Labor Secretary Arthur Goldberg is perhaps more public relations conscious than any official in Washington, but recently he stubbed his toe.

Goldberg put out a press release urging the government to adopt a plan whereby wives of U. S. officials could accompany their husbands on junkets overseas. His idea was to permit officials to apply government travel money on two tourist-class fares rather than the one first-class fare his release said they're now entitled to. Any extra cost, he said, would be paid by the individual—and the plan "would not cost the government an additional penny."

What he forgot—or didn't know—was that official U. S. policy already urges official travelers to use tourist class whenever possible—with or without wives. To make matters worse, he sent a letter outlining the proposal to Comptroller General Joseph Campbell, who has long waged war against first-class fares for U. S. employes and rapped defense contractors for wasting "millions" of taxpayer dollars by letting their employes travel deluxe on "cost-plus" defense jobs.

Nine Nations Form Space Combine

Nine countries have banded together to set up a space development organization to launch satellites for communications and scientific purposes. Great Britain, France, Australia, Belgium, Denmark, Holland, Italy, Spain and West Germany are the nations involved. British Minister of Aviation Peter Thorneycroft has stated that the organization "gives us the opportunity, which otherwise would be denied us, of taking some part in the commercial exploitation of space."

The total cost of the project is estimated to be 200 million dollars, with Britain contributing about one-third of the total. The satellite launch vehicle will be a three-stage rocket: The first stage will be a "Blue Streak" British rocket; the second will be developed in France; and the third will be produced by West Germany. The group provides for an extensive program of research by the member nations during the first two years. Following this period the British rocket will be test fired from the Woomera Range in Australia.

Obviously, the Russians are quietly working to perfect a space communications system of their own and now the entry of these nine friendly nations into the space communications field accentuates the importance of getting the U. S. program in orbit.

Some observers have even suggested that the nation which first establishes a world-wide space communications network may have a decided influence on language trends in the future. If this nation doesn't soon put an end to the intramural squabbling which has stalled the satellite space program, that language is likely to have a distinct Russian flavor.

Importance of Consumer Grows

The Agriculture Department has appointed an advisory committee on rural area development, to be headed by Clarence J. McCormick of Vincennes, Ind. Included in the committee membership are representatives of the NRECA, the National Council of Farmer Cooperatives, and local REA co-ops. In announcing the appointment of the committee, Agriculture Secretary Freeman said that priority attention is being given to insure that the initiation of rural area development programs and maximum participation therein "shall rest with citizens and groups of citizens and state and local governments and their instrumentalities."

Although the newly appointed committee has more of an industry orientation to it, Secretary Freeman's words call to mind the administration's plans to give the consumer a louder voice in matters which affect him.

During the presidential campaign of 1960, Mr. Kennedy stressed the need

(Continued on page 90)

TRANSMISSION SYSTEMS FOR COMMUNICATIONS

By RAY BLAIN

PART 1

TRANSMISSION is not a static field. Prior to 1930, it was largely concerned with defining bandwidth, loss and interference objectives for telephone and telegraph service, and learning to meet them with an economic combination of transmitters, receivers, wire lines and amplifiers.

In the following two and a half decades, the bulk of the advanced work in transmission involved designing, manufacturing, and operating carrier systems. The provision of a large number of economical long and short-haul channels, including both message and special service facilities, was the primary objective. From both the design and operating viewpoints, the transmission systems required to meet these objectives are well-defined entities meeting specific requirements. As a result, the inter-relationships among these toll systems and the connecting local plant were treated as particular and, in most instances, not controlling problems.

The growing demand for high quality channels, with the advent of new technology, is rapidly leading to a new era of transmission. In the coming decade, this will be characterized by the application of new techniques to improve the quality and increase the quantity of both long distance and local facilities, by the increased complexity of plant used in making a call with an attendant large emphasis on engineering for maintenance, and by the provision of new services.

The following text has evolved over a period of years during the presentation of courses in transmission instruction to Bell Telephone Laboratories and Bell System operating company groups. Numerous individuals in the Bell System have provided ideas and furnished material on which this text is based.

Transmission System Environment

In the provision of telephone service which permits people to talk together at a distance, the telephone system must supply the means and facilities for connecting together the particular telephone stations at the beginning of the call and disconnecting them when the call is completed. Both switching and transmission problems are involved. The switching problem is concerned with selecting and connecting together the customers and transmission path, and includes supplying and interpreting the control and supervisory signals required to perform this operation. The transmission problem, which is the concern of this test, deals with the transmission of these control signals and the customer's message. The term "message" as used in this case denotes any information that a customer might desire to transmit from one place to another, e.g., speech, TV, data, etc.

In its simplest form, a transmission system consists of a pair of wires connecting two telephones. More commonly, the term "transmission system" is used to denote a complex aggregate of electronic gear and the associated medium, which together provide a multiplicity of channels over which a num-

About This Important Series

This series of articles by Mr. Blain is based on a two-volume book titled, "Transmission Systems for Communications", published by the Bell Telephone Laboratories.

We are grateful to the laboratories for granting us permission to reprint a condensed version of this outstanding book on such an important subject. Our plans are to present those parts of the book which, in our opinion, will prove most useful to the Independent industry in maintaining its transmission systems in such a manner that will satisfactorily meet the requirements of DDD and the National Toll Plan.

This first installment covers transmission system environment, message channel objectives and voice frequency transmission. In later articles we will cover telephone sets, design of loops and trunks, and exchange area layouts. We will also discuss voice frequency repeaters, carrier and microwave systems.

It is our belief, that this is the transmission information Independent companies have been waiting for and that they will find it extremely useful.

It may not be possible to publish these articles in consecutive issues. We shall, however, publish them with a frequency that will maintain interest in this important subject of transmission.

ber of customers' messages and the associated signaling information can be transmitted.

In general, a call between two points, in any except a purely local situation, will be handled by connecting a number of different transmission systems in tandem to form an over-all transmission facility between the two points. The manner in which these systems are selected and interconnected has a strong bearing on the characteristics required for each system.

Similarly, the manner in which television and many other special service facilities are built up reacts on the performance required for each transmission system used to carry these types of services. This is due to the fact that each element which forms a link in the over-all transmission facility between two points will add some degradation to a message.

As a result of the relationship between performance and cost of a transmission system, it cannot be considered only in terms of an isolated system, but must also be viewed with respect to the relation of the system to the building up of a complete facility. Thus, the solution of design, manufacturing, and operations problems for a specific system will more often than not require knowledge of other systems in the telephone plant, both existing and planned.

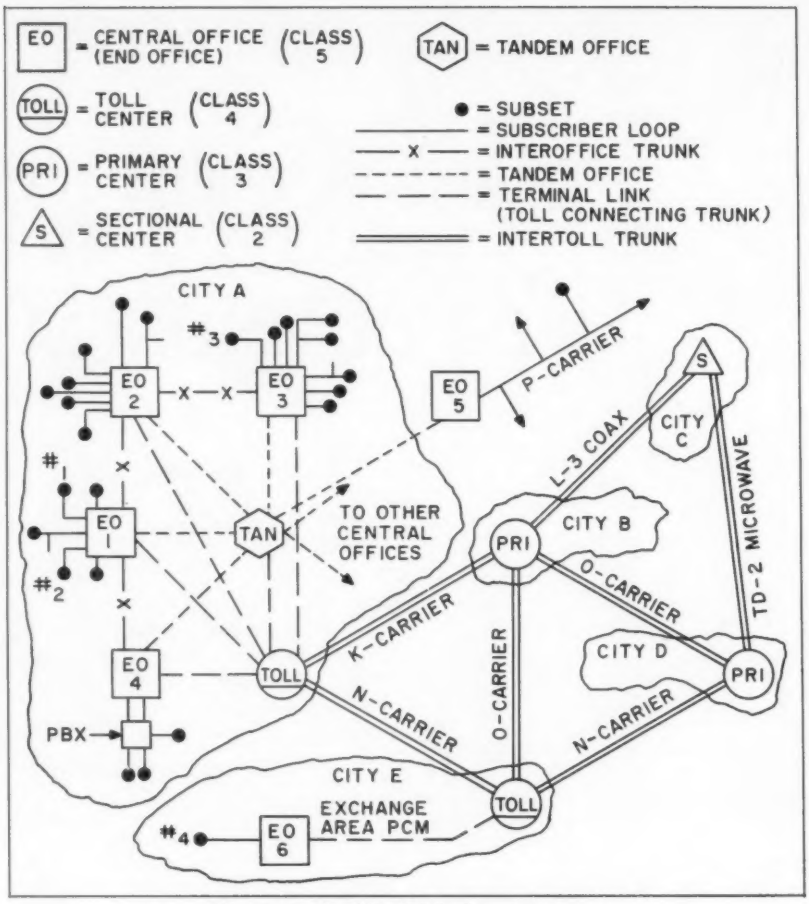

Fig. 1. A simplified telephone system.

Service and the Connection Problem

An example of the large variety of facilities that might be used in handling a telephone call is illustrated in *Fig. 1*. A block schematic of a typical long connection is indicated in *Fig. 2*. A connection may involve voice frequency transmission between subsets through a single central office or a multiplicity of links including several offices, voice frequency paths and carrier systems.

The subscriber's subset modulates a direct current (usually transmitted from the central office) with the acoustic speech message to be transmitted. The subset also demodulates the received signal and returns it to its acoustic form. In addition, it generates supervisory signals (on-hook and off-hook) and switching signals (dial pulses). There is a variety of types of subsets in use, each having somewhat different frequency response and transmitter and receiver efficiency. The importance of these factors will be discussed later in this article.

The subscriber's loop provides a two-way path for the speech signals and the ringing, switching, and supervisory signals. Since the subset and subscriber's loops are permanently associated, their combined transmission properties may be adjusted so as to meet their share of the message channel objectives that will be discussed later. For example, the greater efficiency of the 500-type subset is used to permit increased loop loss over longer distances or finer gauge wire. The performance and limitation of loops will also be discussed later.

The small percentage of time (of the order of 2 per cent) that a subscriber's loop is used has led to the consideration of "line concentrators" for use between the subscribers and the central office. In effect, the concentrator is a partial central office, and the pair which connects it to the true central office, and which formerly was part of the loop plant, must now be thought of as a trunk. The essential difference between a loop and a trunk is that a loop is permanently associated with a particular subscriber and the subset, whereas a trunk is a common usage connection.

Trunks of various types are used to interconnect central and toll offices. An inter-office trunk connects a local central office to another central office, a tandem trunk connects an end office to a tandem office, while a toll-connecting trunk connects a local office to the toll office. In general, local offices connect to toll offices by direct trunks rather than by way of tandem offices. In toll language, toll connecting trunks are also described as "terminating links".

Up to the point where the signals are connected to inter-toll trunks in the toll office, the message and supervisory signals may be handled on a two-wire voice frequency basis (this means that the same pair of wires is used for both directions of transmission) by a carrier, used as toll connecting trunks. At the toll office, after appropriate switching and routing, the signals are generally connected to the toll trunks by means of a four-wire terminating set, which splits apart the two directions of transmission so that the long-haul transmission may be accomplished on a four-wire basis. Some short inter-toll trunks are handled by two-wire transmission. Through these inter-toll trunks, the signals are transmitted to remote toll switching centers—which, in turn are connected by inter-toll trunks to other switching centers—

(Continued on page 24)

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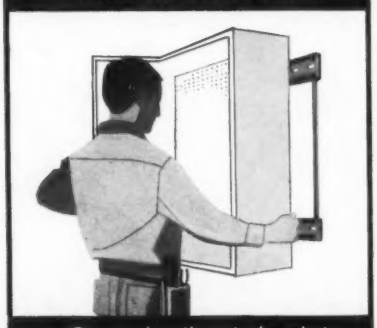
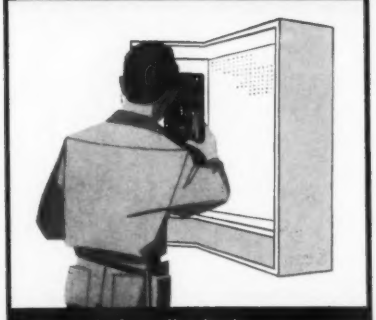
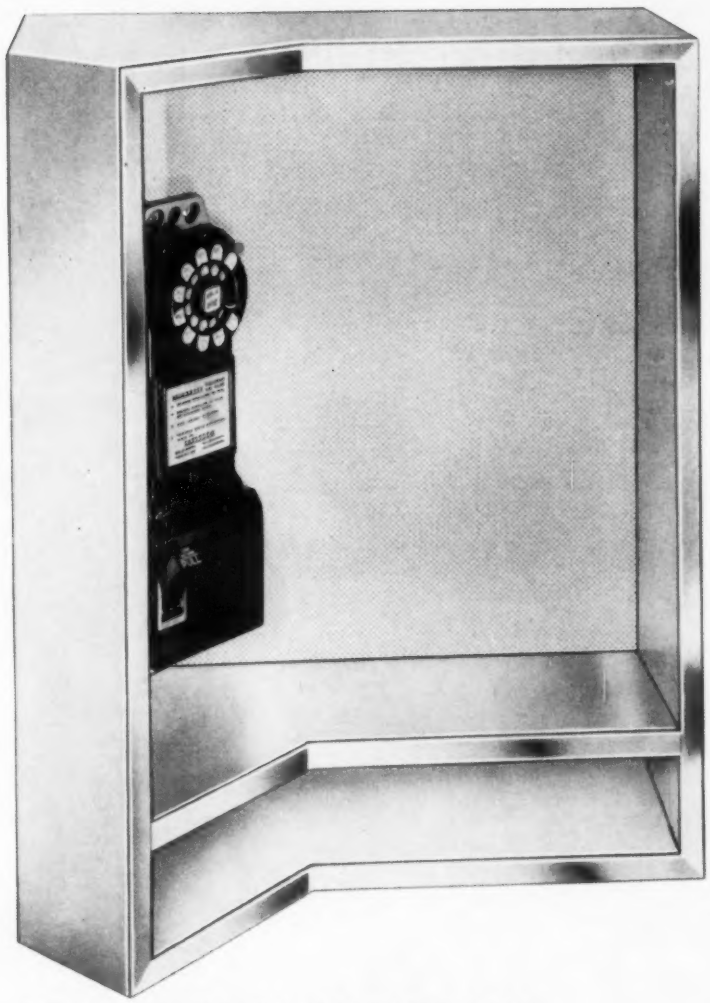


2. Secure booth onto bracket.



3. Install telephone.



Model 20 Acousti-Call booth combines caller's comfort with fresh, functional design. Booth appears open and roomy, yet is actually more compact than most acoustical phone booths (27" wide and 17⅛" deep over-all). It's available in three contemporary colors: blue, coral and green with ivory colored interiors.

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This is not to be construed as a product endorsement by United States Independent Telephone Association.

Less than a hundred years ago, Scottsbluff was pioneer country, its hills echoing to the wagon master's cry of "Wagons Ho!" Today this area of the North Platte valley and adjoining Western Nebraska and Eastern Wyoming is a thriving center of farms, cattle, oil and industry. The United Telephone Company of the West serves this region with upwards of 20,000 telephones, all dial operated. Like other progressive Independents all over the nation, United chooses Sherron steel booths for its lucrative pay-station locations. The above photo depicts a typical Sherron installation by United.

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An around the clock pressure check, the J31 Pressure Guard (cable or pole-mounted) alerts crews to low cable pressure levels before moisture can start trouble.

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A real time saver for performing the mathematical computations required for analysis of cable pressure systems. The PEC Pressurization Slide Rule lists pneumatic resistances for all gauges and pairs of cables. Computations can be made for flow, pressure drops, distance and pneumatic resistance, etc.

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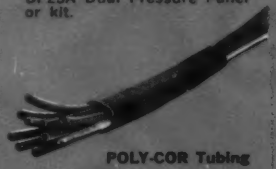
A complete, easy to use Kit makes possible the use of the spray leak test method of locating cable sheath breaks at low cost.

DP25A Dual Pressure Panel

Pressurized dry air can be supplied at two different pressures from Puregas Air Dryers by employing the DP25A Dual Pressure Panel or kit.



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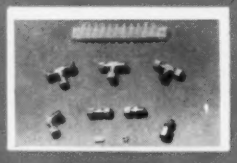
Light, flexible, simple to install Poly-cor instrument tubing available with 3, 5, or 10 coded ¼" tubes in moulded harness. Poly-cor tubing is used to pipe pressurized dry air from meter panels to cables.



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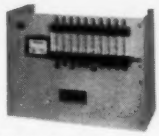
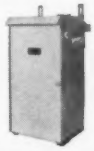
The new AO-1 oiler maintains correct oil level and increases the oil capacity of any X-2 Compressor.



MP25A Meter Panel

Puregas Field Proven Meter Panels measure and distribute pressurized dry air to toll, trunk and exchange cables. Available with banks of 3, 5 or 10 air flow indicators, the MP25A will determine when maintenance is required on the outside cable plant.



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Model 600 Air Dryer

This economical "Packaged Pressure Source" was specially designed for small telephone exchanges, CDO's, repeater, toll cable stations, railroads and other various communication networks. This unit, providing 600 std. cu. ft. of dry air per day, is available with a factory mounted meter panel.

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A 750 std. cu. ft. per day Pressure Source available to pressurize small to medium size exchange cable plants.

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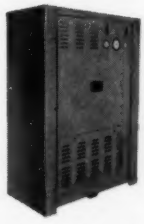

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This 5000 std. cu. ft. per day Dry Air Source will pressurize the cables of large telephone exchanges and central offices.

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- ☐ *Cable Pressurization Computer*
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- ☐ *Bulletin 120—Cost Comparison—Dry Air vs. Nitrogen*
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and ultimately reach the recipient of the call through another four-wire terminating set and other local switching equipment, toll connecting trunks and a final subscriber's loop.

The types of facilities that might be involved in various connections can be more easily understood by referring to *Fig. 1*. The most elementary connection would be a call between subsets 1 and 2, both working out of End Office 1, in which no trunks would be involved. End office is the designation assigned to the lowest office in the toll switching plan. An interoffice call between subsets 1 and 3 in City "A" would use two trunks, the connection being made via a tandem office. These trunks would normally be voice frequency circuits, possibly equipped with negative impedance repeaters; or a short-haul carrier such as N, or, in the future, transmission might be via a pulse code modulation system.

Next, consider a call between Subset 1 in City A and Subset 5 in City E. The path begins at a subscriber loop working into End Office 1. From there, it makes use of a voice frequency toll connecting trunk to the toll center. In the skeletonized system shown here, there are two paths to the toll center in City A—one through the tandem office. Between City A and City E there are a number of routes. If the two cities have a high community of interest, there would be direct trunks between them. *Fig. 1* also indicates that in this case the two cities are linked by, for example, "N" carrier. An alternate route which happens to employ "K" carrier is also indicated, via a primary center. Out of this primary center (Class 3) there might be direct, high-usage trunks on "O" carrier to City E. Alternatively, use would be made of "final" trunks to a sectional center (Class 2) at City C, from which connection might be made to City E through another sectional center and another primary center. These latter trunks might be on an L3 coaxial system or a TD-2 microwave radio system.

Toll Switching Plan

The plan selected to connect toll offices has a large bearing on the performance required of both local and toll transmission systems. In early practice, toll circuits were operated manually by operators on a so-called "ring down" basis. With these arrangements, the number of circuits that could be connected in tandem was extremely limited, and comparatively limited use was made of alternate routing. Speed of service was comparatively slow and trunks were inefficiently used in many cases.

The introduction of automatic switching of toll circuits permits calls to be switched so rapidly and cheaply that, by using alternate routes, circuits can be laid out and built up much more economically. An example of the impact of toll dialing on the trunk layout is indicated in *Fig. 3*. The upper diagram (a) indicates the circuit groups which would be required to handle an assumed flow of traffic on a ring down manual basis. The lower diagram (b) indicates the circuit groups that would be required for the same traffic using toll dialing. Direct connection between offices is provided where heavy traffic is expected—the "high usage" groups, but alternative "final"—or "last resort" routes—are provided to handle overflow traffic. In (a) there are 44 different circuit groups. In (b) there are 26 circuit groups which are larger and used on a more efficient basis.

In the present toll switching plan, there are five ranks or classes of switching centers. The highest rank is the Regional Center. The lowest rank, called the End Office, is the telephone exchange in which the subscribers' loops terminate. The chain of switching centers, and an illustration of how a call might be routed are indicated in *Fig. 4*. The order of choice at each control center is indicated by the numbers in parentheses. In the example, there are 10 possible routes for the call, only one of which requires the maximum of seven intermediate links. In this discussion, the number of links refers to the number of toll trunks in tandem and does not include the two "terminating links" (toll connecting trunks) at the end of the connection. Note, also, that the first choice route involves two intermediate links. In many cases, a single link exists between the toll centers which would be the first choice.

The probability that a call will require more than N links in tandem to reach its destination decreases rapidly as N increases from 2 to 7. First, a large majority of toll calls are between end offices associated with the same regional center. The final routes in these cases will not extend as far as the Regional Center, and may not involve even the next lower ranking centers in the chain. The maximum number of toll trunks in these connections is, therefore, less than seven.

Secondly, even a call between telephones associated with different re-

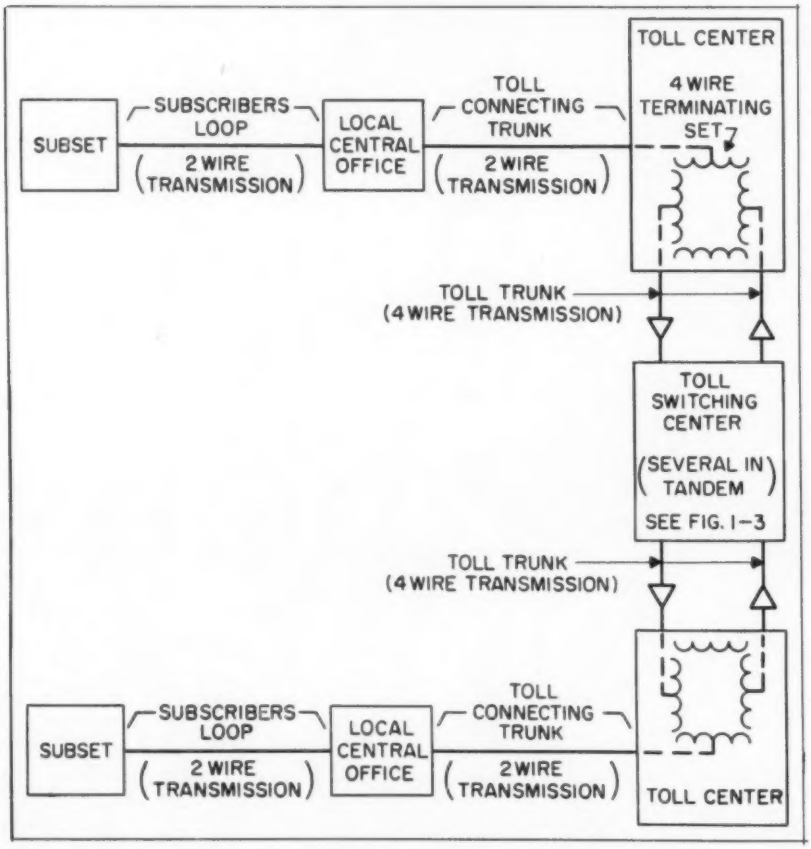

Fig. 2. Inter-city subscriber to subscriber connection.

(Continued on page 28)

BULLETIN: EARLY TABULATIONS SHOW NEW *FLEET-SIZE* LARK HAS WON ACCEPTANCE

'62 LARK FLEET ORDERS IN FIRST 3½ WEEKS—

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HERE ARE THE REASONS WHY THE NEW FLEET-SIZE LARKS ARE GOING PLACES IN '62

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- **NEW INTERIOR DIMENSIONS** provide legroom comparable to Cadillac—over 6 inches more legroom than Plymouth, over 12 inches more than Corvair Monza!
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gional centers is routed over the maximum of seven intermediate toll links only when all of the normally available high-usage trunk groups are busy. The probability of this happening in the case indicated in *Fig. 4* is only p5, where p is the probability that all trunks in any one high-usage group are busy.

Thirdly, many calls do not originate all the way down the line since each class has all the duties—in its area—of all lower classes except 5.

It is apparent that the switching pattern that has been described imposes strict transmission requirements on the toll trunks. Up to seven toll trunks may be connected in tandem, and successive calls between the same two telephones may take different routes and encounter different numbers and kinds of circuits. The loss must not be excessive when calls are routed over the maximum number of links, and there should not be too great a variation in the transmission afforded over the different possible paths that a call might be routed. Loss cannot be permitted to drop too low either, or echo, singing, crosstalk, and noise can cause excessive transmission impairment. Design and maintenance must both recognize that if unsatisfactory transmission should occur it will not be observed by an operator as in the past, and that the customer's attempt to call unsatisfactory transmission to an operator's attention will disconnect the circuit against which the complaint is made. Identification of the source of the trouble will then prove extremely difficult.

Carrier, Radio Transmission Systems and Components

The over-all communication channel connecting two message or television customers is seen to be composed of numerous links, each of which, in general, is itself a complete channel provided by a transmission system. The transmission system may be a pair of wires with or without amplifiers, or a carrier system providing anywhere from a few to many hundreds of telephone channels combined into a single "broadband channel," or it may be a video or carrier system providing a single television channel.

While message systems are normally designed and operated to supply two-way communications, the fact that four-wire transmission is used in most of the toll plant—and increasingly in the local plant—makes it possible to analyze such systems in terms of one-way transmission. Similarly, television systems can be analyzed in terms of one-way transmission, even though

(Continued on page 88)

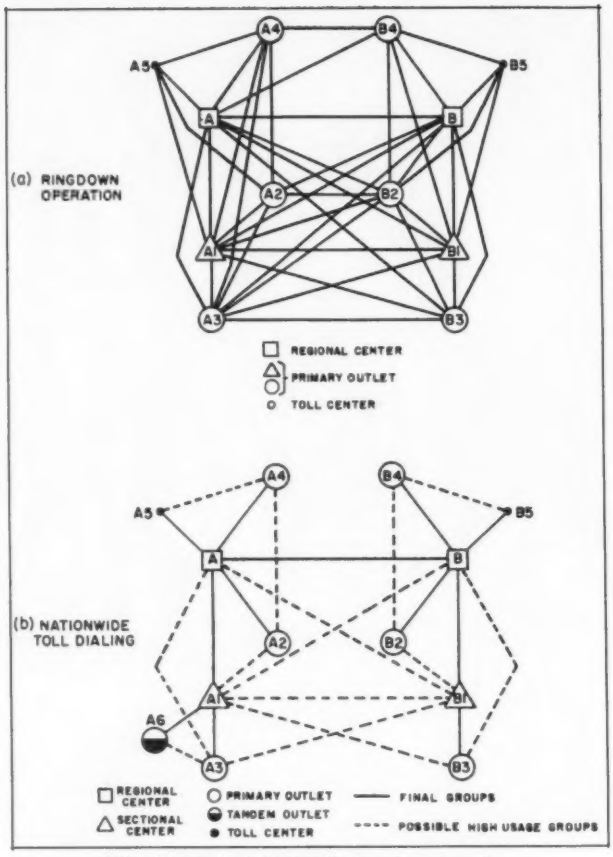


Fig. 3. Typical intertoll trunk networks.

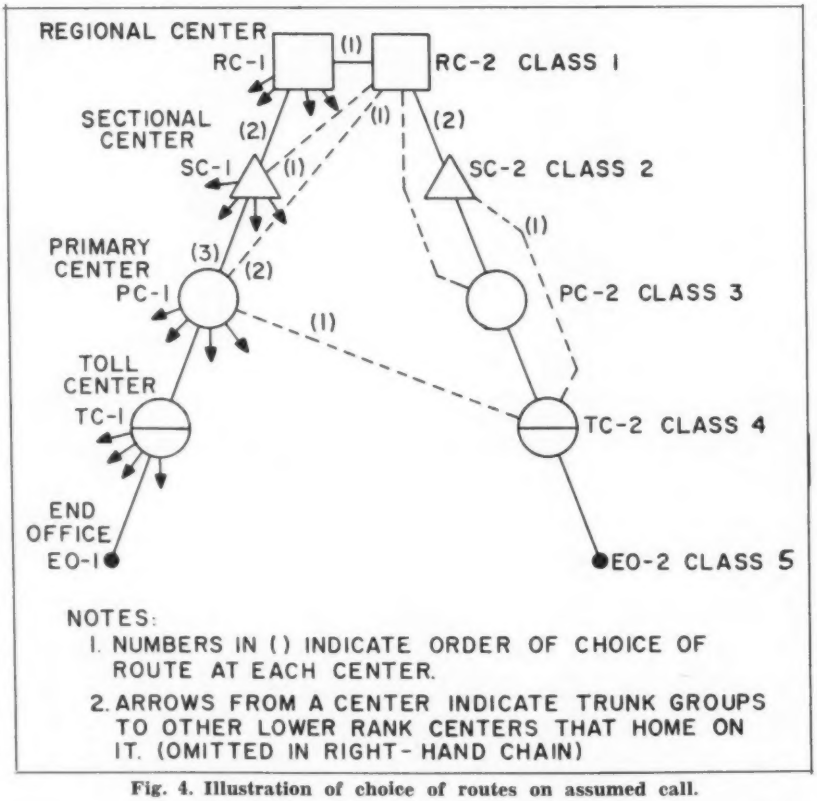


Fig. 4. Illustration of choice of routes on assumed call.

In the time it takes this to make 1 hole in concrete

this makes 5 permanent fastenings

The timesaver on the right is called Shure-Set.® Instead of making holes in concrete (slowly) it makes permanent fastenings (quickly). This easily. Insert a Shure-Set fastener in one end. Strike the other end with a hammer. Less than 5 taps and the fastener permanently anchors a 2 x 4 – or a duct strap, or a junction box, or most anything – to concrete. No drilling. No expansion devices. No powder charge. And no sweat. If your time is money – Shure-Set saves a lot of both – it'll pay for itself first day out on the job. Shure-Set tools and fasteners are available from your local Ramset or Shure-Set dealer. He's listed in the Yellow Pages, under "Tools."

Ramset® WINCHESTER-WESTERN DIVISION **Olin**
297-L Winchester Ave., New Haven 4, Conn.

2 *new features expand your market*

CALL COMMANDER IS EASY TO OPERATE

To place outside call, press an unlighted Line button. When button lights and dial tone sounds, line is then ready for use.

To answer outside call, press button that has flashing light, and answer. A constant light indicates that the line is in use.

To hold call, press common Hold button. To remove line from hold, press button of line being held (indicated by "winking" light).

INTERCOM SERVICE

gives Call Commander more facilities

- Selective dialing for up to 36 stations
- Pre-Set Conference—up to six other people may be called simultaneously by pushbutton or dial
- Add-On Conference—enables you to add another person within office to an outside call
- Camp-On—reserves busy line for caller and automatically connects when line is free
- Privacy on intercom lines through the use of "talking link" circuits
- Busy tone feature on "talking link" circuits
- Control of station signaling device from two separate signal sources
- "Long line" connects an off-premise station to Intercom Service—also enables anyone to dial up to six stations consecutively (ideal for quick telephone conferences)

for **10-A1** *key system*

1 CALL COMMANDER® **telephone—an 18-pushbutton phone to meet every need**

2 INTERCOM SERVICE—**expanded intercom facilities to serve business better**

AE's 10-A1 Key Telephone System now offers your subscribers—large or small—*custom* communications, inside and out. Two new features are the reason: the Call Commander phone and the Intercom Service.

Call Commander operates like our regular key phone, but offers greater pushbutton capacity—up to 18 central office lines with the 10-A1 system. When combined with the Intercom Service, Call Commander provides many new and varied facilities (listed on opposite page).

Call Commander is modern and compact. Its slanted face, enhanced with clear lucite, makes lamp signals and number strips easy to see... easy to use. Available in two handsome colors: Sand Beige and Jade Green.

10-A1's increased flexibility puts prospects everywhere. It also enables you to expand present key system installations that are no longer adequate. Your revenue opportunity is unlimited. For full information, write for our free 10-A1 sales aids.

FREE **SALES AIDS HELP YOU SELL 10-A1 KEY SYSTEM**

New sales material describes 10-A1 Key System, Call Commander and Intercom Service. Includes circulars, model sales letters and ordering information. For your free 10-A1 sales aids, write: *Automatic Electric Sales Corporation, Northlake, Illinois.*

AUTOMATIC ELECTRIC

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

TODAY'S HIGHLIGHTS

of finance-taxes-business trends

By WILLARD F. STANLEY

BOND PRICES CONTINUE RISE: Unchecked by several months of favorable price movements, bond prices continued to ascend in the 30 days ended Nov. 20. Significant evidence of this development was the Wall Street Journal's tabulation of 11 new utility bond issues which showed, at Nov. 15, an average yield, based on bid prices on that date, seven decimals (0.07 percent per annum) lower than the average yields on the basis of the original offering prices of these securities. Eight of the bids were higher than the offering prices, and only three were below.

On Nov. 14, a double-A-rated electric utility issue was offered at a 4.43 percent yield basis and the next day a triple-A-rated telephone subsidiary of the Bell system was offered on a 4.44 percent basis. Both these issues had lower yields because provision was made to prohibit redemption of the bonds during the first five years. The similarity of yields, despite the difference in rating, reflects the generally higher evaluation placed on first mortgage bonds of electric utilities than on debentures of AT&T subsidiaries, rather than any pronounced change in bond prices during the one-day interval between the two offerings.

With the economic recovery slowed down somewhat, demands for credit have not been as high as expected, with the result that bond prices continue to hold firm and advance moderately, but there are straws showing the wind may be blowing, long range, toward higher interest rates. Notable among these items are the recent higher rates for 90-day treasury bills and the advance by New York savings banks of interest paid on their deposits by ¼ percent per annum.

It seems desirable for utility managements to take advantage of the relatively favorable yields now prevailing by bringing to market new issues of funded debt and other senior securities as rapidly as possible, without drastic acceleration. There is always the chance that later offerings may boast lower yields, but the odds seem to be somewhat against this as the months go by.

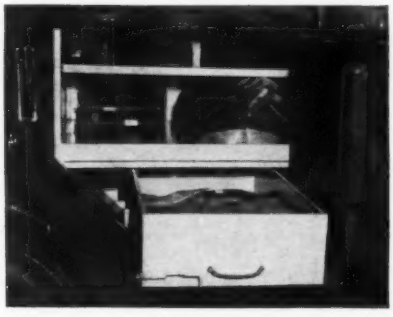
Once again the green light shines brightly on common stock offerings, with the average price-earnings ratio for utility common stocks reaching a new high at 22.4 in November as compared with 21.5 for the previous month. Forward requirements should be raised where feasible up to two years or longer, for while the recent past indicates a rise in utility prices could continue, the present levels, in relation to financial history, are so phenomenal as to warrant taking advantage of going rates to the fullest possible extent.

* * *

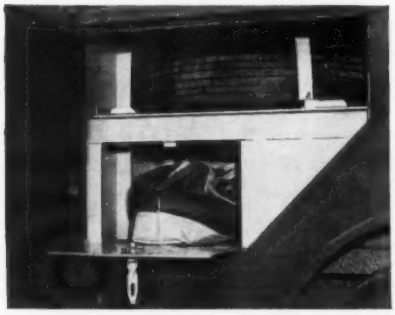
COMMON STOCKS EVINCE SHARP RISE: Somewhat surprisingly, in the face of

Mr. Stanley, formerly a utility financial executive, is now president of Corporate Services, Inc. of New York City and is well known as a financial writer. He is a member of the Controllers Institute of America and the New York Society of Security Analysts. He serves on the Finance Management Committee and the Tax Committee of the Controllers Institute (N. Y. Control). His articles are appearing once a month in TELEPHONY.

HOLAN'S HU-76 Telephone Installers' Body



In addition to the double-doored rear entry to spacious drawers and shelves, the right side compartment contains a saw rack, extra coil of wire for PR reel, drawer for inside wire and a tool bag/spec book shelf.



Spare tire and personal equipment shelves are stored in the left side compartment. Personal equipment bin can be locked separately.

Is a Low, Lightweight "Curbside Cupboard"

Any way you look at it — or out of it — Holan's new HU-76 Telephone Installers' Body is a "curbside cupboard" that speeds the work of the installer, repairman or troubleman.

The low silhouette (only 35" high) permits unrestricted rear vision for safety and maneuverability.

Compartmentation design of the HU-76 puts tools and supplies where they are accessible — the rear and curbside for safe and efficient use.

Long-lasting Hi-Tensile Steel . . . and a roof of fiberglass reinforced plastic . . . cut total body weight to 740 pounds, thus longer tire wear, chassis life and greater fuel economy reduce operating and maintenance costs.

Call or write Holan Corporation of Georgia, Everee Inn Road, Griffin, Georgia, for more information about this low silhouette, lightweight, money-saving body.

Holan Corporation, 4100 W. 150th St., Cleveland 35, Ohio

Holan

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HOLAN

the "tax selling" which has been so widely spoken of, the stock market, in the period from Oct. 27 to Nov. 24, was able to register a reasonably sharp and continuous improvement in price averages. The increase in the New York Times 50-combined-stock average during this period was over 4 percent, leaving this average at the latter date more than 16 percent ahead of the 1960 year end, 10 percent above the 1958 close, and less than 3 percent below the close for 1959, which approximated the all-time high for this average.

Statistics have been generally favorable, although third-quarter earnings of some 800 corporations as reported by the First National City Bank of New York, fell back about 2 percent from the June quarter and nine-month 1961 earnings were 5 percent below the preceding year. However, for the third quarter, there was an increase of 8 percent from the similar quarter in 1960. The profit squeeze was again in evidence, with the profit margin falling for the third quarter to 5.8 cents of the sales dollar compared with 6.1 cents in the spring quarter.

Selectivity in the stock market appears likely to be an unusually strong feature for the balance of this year. A minority of stocks, principally electronics, show substantial fairly recent losses and are, accordingly, vulnerable to tax selling during the balance of the year.

On the other hand, the majority of stocks show paper profits for this year so that considerable switching, with consequent spottiness in individual issues, seems likely.

The more fortunate issues in terms of recent market action may benefit by switches from the electronics and other depressed items, while the market average may move more or less sideways, reflecting tax selling of the loss items and switches to the favorably situated stocks.

* * *

RECOVERY CONTINUES STRONG, BUT AT SOMEWHAT ABATED PACE: There is a general sense that the national economic recovery, while still sound and strong, is not moving forward as fast as was anticipated. In October, industrial production regained its high of 113, previously reflected in August, after a drop of one point in September. But throughout the entire economic edifice, there are evidences of timidity in the forward movement.

Capital expenditures are presently estimated somewhat below earlier figures. Hesitation also seems apparent as to building up inventory.

The continued squeeze in profits, mentioned above, is probably the greatest factor contributing to the hesitancy. Usually profit margins fall sharply in times of recession and, in turn, increase at a rapid rate when recovery ensues. But this has not been true in the present case to the usual extent.

Increased wage demands continue to harass business, which has been torn between (1) absorbing the rise in wages or (2) attempting to recover it in higher prices which might slow down consumption.

* * *

UTILITY EARNINGS CONTINUE IMPROVEMENT: Both electric and gas utilities on the one hand, and telephone systems, on the other, continued to forge ahead with respect to earnings in the third quarter of 1961. The former registered a 6 percent increase over 1960 and the latter, 4 percent. For the nine months of 1961, the gain, in each case, was 5 percent over the similar period of 1960.

These increased earnings, plus continuous upward movement of price-earnings ratios, have brought utility equities to the range of all-time highs, and have made these investments among the most popular with the security-buying public. The protection afforded by utilities operating in relatively small communities in case of nuclear attack, give an added defensive attraction to these investments.

But, despite the recent rosy record, there is reason for caution in new commitments at today's levels. For instance, on the average, stocks in general now reflect a lower yield in relation to the interest rate on high grade bonds than has been previously evidenced in this century. The recent untoward fate of most of the electronic stocks marketwise stands as a striking warning of the serious results of excessive valuation of common stock equities.

But there is nothing to indicate that the utilities might experience anything like the fall in prices registered by the electronic and vending shares. Utility values, while extremely high when viewed historically, are on a much sounder basis and are accompanied by reasonable expectation of enhanced dividends and earnings in the case of most companies.

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- Attractive, modern appearance.
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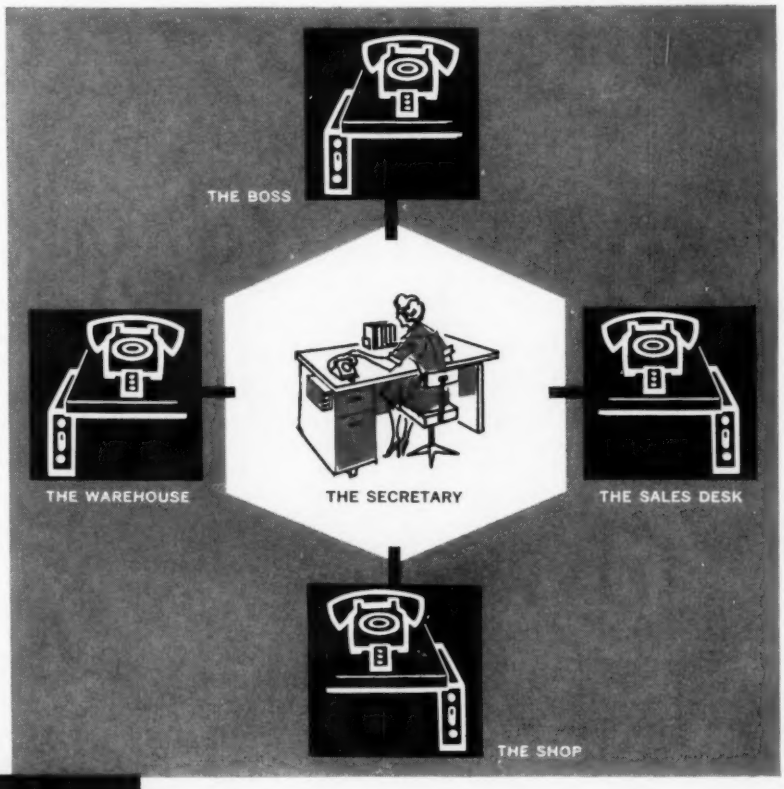

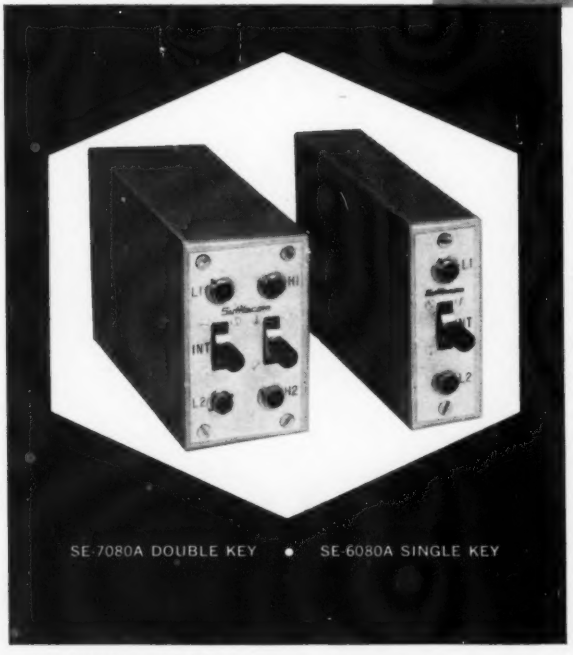

THE MODERN, LOW COST ANSWER TO SMALL BUSINESS COMMUNICATION PROBLEMS!

Suttlecom switching key systems, with two trunk capacity, intercom talking path, busy visuals, and trunk hold features permit operating companies to provide complete, modern telephone service to small business subscribers at low costs never before possible.

Wiring plans for from two to nine instruments are easily handled by Suttlecom Keys, and industry standard Suttle push-buttons, buzzers, 3" bells, and connecting blocks are used. Installation is simple with fully color coded cable and terminal assignments. **No relays needed!** Suttlecom is virtually maintenance free. Uses new 50.00 SE-100X Power Supply!

Total equipment costs for a typical 5 station installation, less telephones, are under $180.00! (Read that again, please!) Write, wire or call Suttle **today** for full literature and prices.

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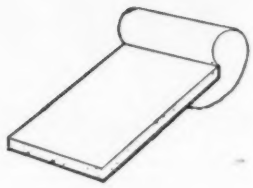
The Plant Man's NOTEBOOK



By RAY BLAIN, Technical Editorial Director

A NON-CONDUCTIVE water-repellent chemical in liquid form, known as Cable-Kote, is now available for use in driving moisture out of either paper or plastic-insulated cable.

This liquid is forced through the cable by the use of dry air or nitrogen gas and any excess may be retrieved for reuse. A tank of the liquid is connected to the air or nitrogen gas supply and 30 pounds of pressure applied to force the liquid through the cable being treated.

The manufacturer claims that the small amount of chemical that adheres to the inner surfaces of the cables will dry out and fill all pin holes in the conductor insulation and sheath. They report that a cable treated in this manner was tested by drilling a series of holes, the size of an average thumbnail, through the sheath along the top. Other holes, similar in size, were drilled on the under side at low points so that water could run through the cable. Even under these extreme conditions, it is stated that all pairs are continuing to provide good service after an elapse of an eight month period.

This chemical is sold by the gallon in liquid form and requires no mixing on the job. It is flammable, however, and precautions should be observed not to use it near an open flame. The vehicle is required to carry the sealing chemical through the cable, but will evaporate. The formula for the liquid is secret, but we understand that it has a silicon base.

A 26-pair cable, in fair condition, will require about 15 gallons of Cable-Kote per mile for treatment. If the cable is old, with numerous sheath openings, a greater volume may be required because of loss due to leakage. On an average, a 100-pair cable may be treated for approximately 3 cents per foot, according to the manufacturer.

It is further stated that the treatment does not block the flow of gas or dry air in a cable after treatment and after the liquid is drained off. Neither does it affect the dielectric balance or capacitance. One treatment, it is claimed, will last for the life of the cable.

It is generally recommended that cables be treated in about 500-foot sections for best results. Working cables may be treated without causing interference.

•

During a symposium in Cambridge, England last May, J. W. Emling, of Bell Telephone Laboratories, made the following statement in connection with his talk titled "Human Factors in Transmission Maintenance":

"With the use of customer dialing, operator supervision of the toll network is lost. There must be more measurements and automatic testing equipment available to compensate for this loss of supervision. The Bell System has installed test equipment to measure noise and net loss twice a day in some 60 installations monitoring 600 central offices.

"Experience has shown that even this equipment is not enough, and that standard deviation from a circuit's designed loss is desired to be one decibel. Toll circuits could be made more stable. The correct maintenance and operation of existing circuits would go a long way towards eliminating the transmission difficulties that are experienced in the present-day network. With technical difficulties corrected, it would be possible to operate toll circuits at one-third to one-half standard deviation.

"Better maintenance may be provided by specific instead of general purpose test gear used for making such tests. The less complicated the test set is for the maintenance people to use the better the maintenance will be."

As an example, Mr. Emling showed slides of an installer's test set for testing customers' loops. On this set, the installer dialed a test number and received a sweeping frequency to operate his test set meter to indicate Go—No Go condition where missing load coil, etc., may impair transmission. This test set was designed deliberately to look fragile, but it isn't. This was done as a psychological trick to get good treatment of the test set from the installers.

•

We have an unconfirmed report that development work is in progress on a clear mucilage-like paint which can be applied to most items of telephone plant to make them invisible.

The advantages claimed for this product are that it provides better public and P.U.C. relations. By camouflaging idle and surplus vehicles, it makes for better management relations. Accounting representatives are confused at the time of inventory, and there are no questions or unfavorable reports.

The disadvantage, however, is that this paint will cost one million dollars per gallon in 500 gallon lots. Containers for the paint disappear, and it is difficult to locate them unless a map is made of the storage spot. Further, it appears that top management doesn't like the idea anyway.

"Cross Talk"

"One unselfish item in the American home is the telephone. When it is used, the pleasure must be shared with someone else."—Jack White.

•

Paul Harvey claims that Americans came furthest, fastest when they scratched the mostest.

background to a new name

TELEPHONE CABLES LIMITED

combines in a single manufacturing and trading unit the experience and resources of several companies, each with vast experience in the production and installation of telephone cables.

As a unit, established in Dagenham more than 50 years ago, it is now the most modern factory in the United Kingdom for the production of plastic and paper insulated telephone cables, with facilities which enable prompt deliveries and service to be assured.

CHEQUERS LANE, DAGENHAM, ENGLAND TELEPHONE: DOMINION 6611 CABLES: DRYCORE DAGENHAM

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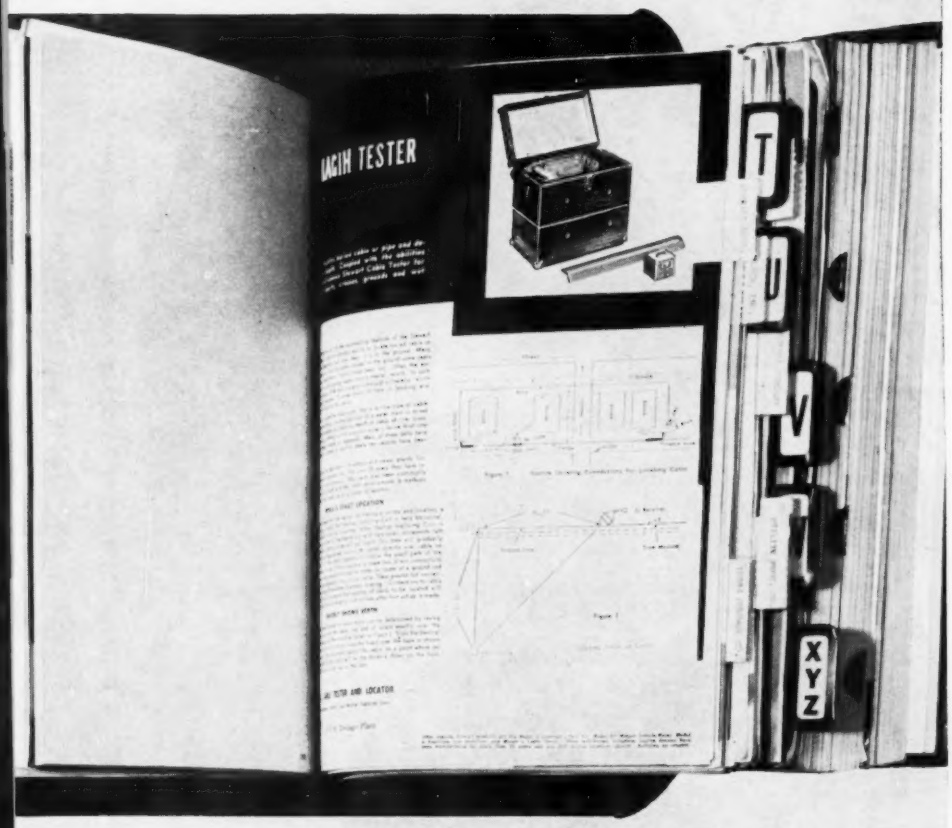
by MANY TRADE NAMES

You are looking at the king-sized product catalog in the Lindsay Telephone Supply sales offices. It contains over 2000 items including WIRE—CABLE—ACCESSORIES—GALVANIZED STRAND—POLE LINE HARDWARE—TELEPHONE CORDS—you name it, we've got it.

We've got product knowledge too . . . our sales personnel "talks your language". No confusion when ordering . . . you get the product you want . . . the product you need . . . in a hurry!

Add them all up . . . broad line—product knowledge—super service in a hurry—and, of great importance, adequate warehousing facilities.



Your Lindsay Telephone Supply Checklist

Here's a handy checklist to use when you order from Lindsay.

- ☐ Alpeth, Figure 8, R.D.W.
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- ☐ Access terminals and Blocks
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- ☐ Protectors, outside, inside
- ☐ Buried plant accessories
- ☐ Telephone Booths, Lighting
- ☐ Strand, Open Wire
- ☐ Strandlinks, Wire vises
- ☐ Dead ends, Tangent grips
- ☐ Staples, Tape, Sleeves, Hardware
- ☐ Batteries, Ringers, Tone Generators
- ☐ Repeaters, Main Frames
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The above items are only part of the broad Lindsay Line. Send in this coupon for additional information on other Lindsay products that fit your requirements.

Please send me information on:

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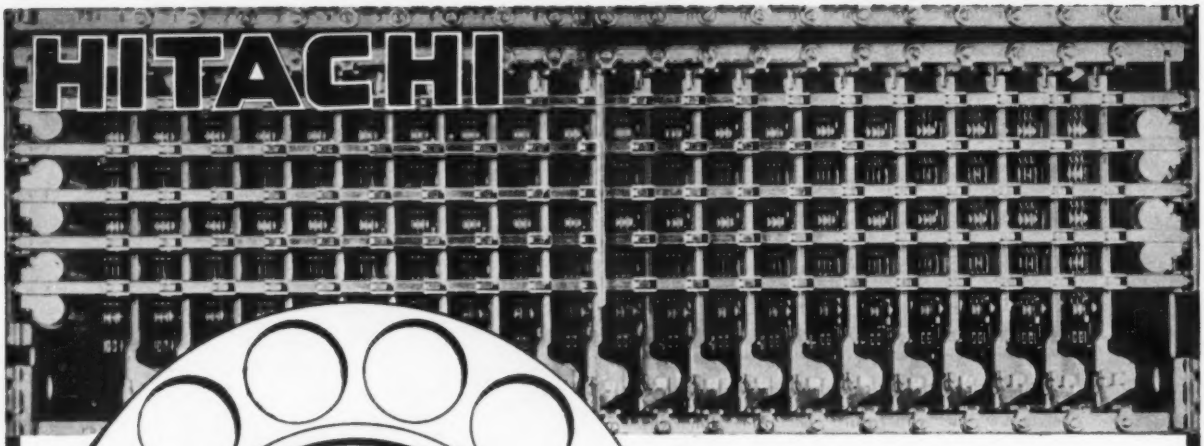

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- Telephones and Switchboards
- Carrier-Current Communication Equipment
- Radio and Television Broadcasting Equipment
- Parts for Communication Equipment
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Electric Wire and Cable

Extensive Hitachi experience with communications systems is reflected in the handsome Type HA-6 telephone set. Its light, compact and sturdy body is tough enough to withstand the shock of being accidentally dropped to the floor. Other outstanding features include high-fidelity transmission and reception, dust-proofed ratchet for ever-smooth dialling action, and clear and commanding bell-tone.

Today's telephone communications authorities are now employing the Crossbar System Automatic Telephone Switchboards in addition to the time-proven "step-by-step" Strowger System. They are finding that the Crossbar System offers many advanced facilities, fewer maintenance problems, minimized failures and longer service life, and that these features are making it ideal for unattended operations. Hitachi has devoted particular attention to the development of the Crossbar System, and consignees continue to report gratifying operating results.

Hitachi, Ltd.
Tokyo Japan

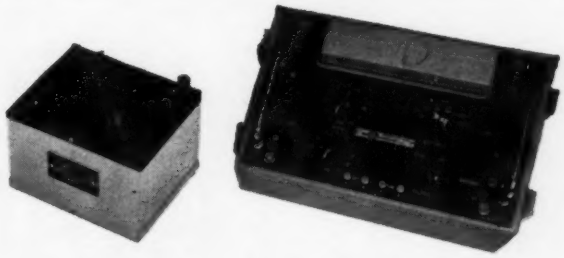
Cable Address: "HITACHY" TOKYO

AIRTRONICS DEPENDABLE PRODUCTS FOR MODERN TELEPHONY

AIRTRONICS Far-end Terminating Set, designed to be used in conjunction with the Model 20B Test Hybrid, supplies the Far-end terminations required for return loss and singing-point tests.

Generally, two precision networks, 115H and 115AL cover the standard cable layouts in exchange plant, (the 115H covering 19 and 22 gauge H88 facilities).

The Far-end Terminating Set consists of a precision network, network build-out decades, selector switch and jacks, and binding posts to give flexible access to the components.

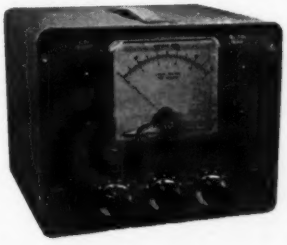


AIRTRONICS new multi-purpose, Portable Test Hybrid Set, Model 20B, makes acceptance, evaluation, and capacity balance tests easier, faster . . . locates cable opens accurately . . . accommodates standard networks. Either Singing-Point or Return Loss techniques can be applied. Accessories include external decade capacitor and variable resistor for use in locating opens, for compromise net, etc. Plug-in dial is also available.

Other Airtronic Products

- **Precision Networks WE 115 type**
- **Build Out and Terminating Set**
- **Program Equalizers**
- **New—New Transmission Measuring Set**

Write for complete details



AIRTRONICS Pulse Meter is compact, easily carried, and plugs into the nearest 115 volt, 60 cycle ac wall outlet. Developed by telephone men FOR telephone men, the new pulse meter and power supply measures dial pulses from 0 to 15 pulses per second and percent make from 0 to 100 percent. It will accept loop, ground, battery, carrier, and polar-duplex pulses. Simple in operation, it can be easily carried and used at the test board, the telephone instrument repair bench—any place in the telephone exchange. For that matter, it can easily be moved to the actual subscriber instrument if the need arises. As an added bonus, the PMVPS-1 also gives you a dc power supply continuously variable from 0 to 300 volts. Use it to check transistor circuits, vacuum tube circuits, as a standby power supply —the sky is the limit! Best of all, you will be surprised that so much can be purchased for such a low price!

AIRTRONICS standard Artificial Lines accurately simulate a loaded or non-loaded cable pair of any desired length — from 600 to 39,600 feet.* Multi-position switches afford instant control over total length or load section lengths, so that coil spacings may be set to better than 1%, or as much as 10%. Common irregularities such as bridged taps, mixed loading or coils omitted can be introduced in a moment.

*Available with plug-in units for either #22 or #24 gauge cable, or mixed 22 and 24 gauge. Other commonly used gauges available on special order.

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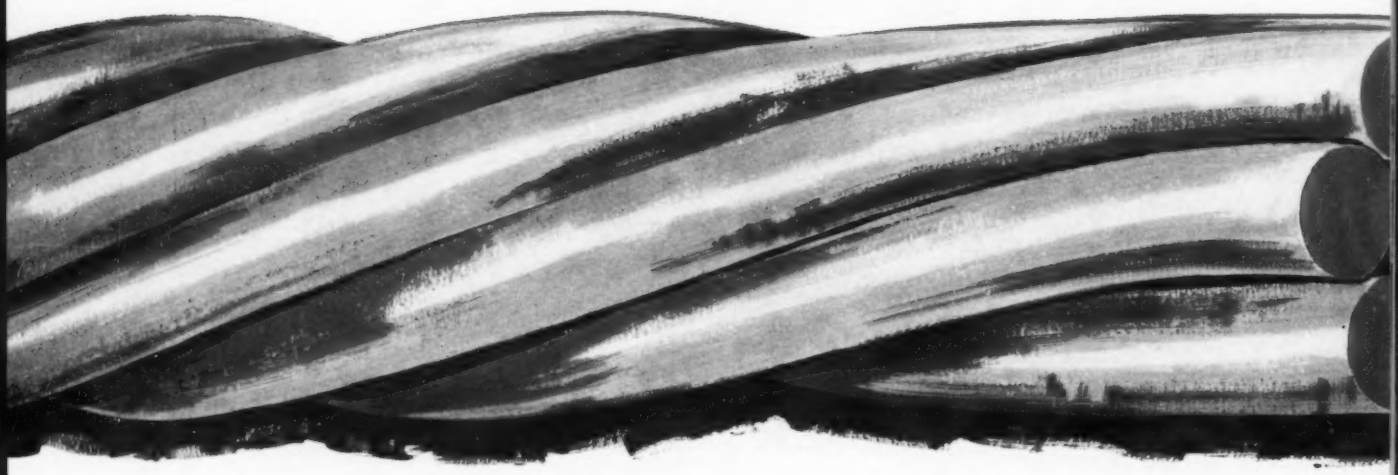

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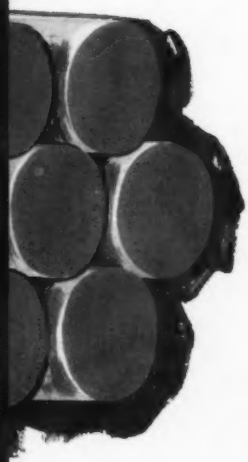

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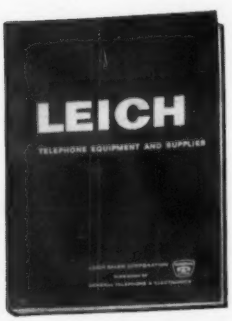
For fast service on Galvanized Strand, just order it out of the nearest LEICH warehouse. A complete range of sizes is available so you can get help in *every* situation. It means lower inventories for *you* . . .

Next time you need high quality telephone supplies and fast dependable service, make the order a LEICH order.

We'll do our level best to serve you well.



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First of four articles telling how a planned public relations program helped Southwestern States Telephone Co. solve problems in serving a Dallas suburb, which experienced a 1,640% population gain in 10 years

BY RICHARD L. POST*

PART 1

WIDESPREAD indeed is the reputation of Texas and Texans for bragging about the biggest, the most and the best anywhere.

But a close look at the explosive growth and development of a Dallas suburb called *Irving* makes most Texas superlatives look diminutive.

For Irving, Tex., an exchange served by The Southwestern States Telephone Co., is the fastest growing city in Texas and one of the fastest growing cities in the nation.

2,000 Upgrade Requests

With a population increase from 2,621 in 1950 to 45,489 in 1960, Irving registered the phenomenal gain in population of 1,640 per cent.

But such growth caused public relations problems one can hardly comprehend for Southwestern States. How this company squared off with a bad public relations situation sparked by nearly 2,000 demands for upgraded service, then initiated one of the most unique and extensive advertising and public relations campaigns probably ever attempted by any telephone company—with rewarding results—is the subject of this series of four articles.

It is a story of how advertising and public relations can pay—and pay big dividends—if properly and wisely directed, and if carried on in conjunction with plant expansion sufficient to provide adequate service.

True, there are few Irving equals, so far as growth stories go, in the nation—probably none. But any city or town served by an Independent telephone company could overnight witness the same type of population explosion, merely by the location of a new plant or industry nearby. And any telephone company could be faced with the same public relations problems, resulting from sudden growth, that plagued Southwestern States.

Since TELEPHONY editors say readers indicate that case histories

Aerial photograph showing Irving, Tex. (foreground), the state's fastest growing city, with Dallas in the background. Irving is served by Southwestern States Telephone Co.

*Mr. Post is Public Relations Director of Southwestern States Telephone Co., Brownwood, Tex.

are helpful and beneficial, and because the same type of growth situation could happen anywhere, the story of Irving and Southwestern States' advertising and public relations efforts is being shared through this publication.

First, let's look at Irving—its make-up, its people.

Irving adjoins Dallas and is called a bedroom city, since about 75 per cent of its residents live in Irving and work in Dallas. Twelve-lane expressways link the two cities, making an Irving home no more than 15 minutes from downtown Dallas.

Not only is Irving large because of its mushrooming growth, but it is prosperous. Average family buying power was set at $7,236 during a study made in 1957 and is even larger today.

Above Average Earnings

These are not wealthy, upper-crust families—but people of above-average earning ability. An example of this is the fact that 34 per cent of Irving homes have central air conditioning—one of the highest percentages in the nation. Over 90 per cent either have central air conditioning or window air conditioning units. Eighty-five per cent of the homes built in the last three years have been built with central air conditioning.

And, there are lots of new homes and more under construction in Irving. A June, 1960 newspaper article stated that more than 3,200 homes had been built in the last three years. Building permits run about 20 million dollars annually.

There are other unique characteristics about Irving. Over 99 per cent of the population are native-born white. It's an unusually young city—more than 80 per cent of the people are under 45 years of age. It's a community of young, growing families.

This is Irving—fastest growing city in Texas.

Such fantastic growth would naturally cause telephone service problems. But, in the case of Irving, the service situation was made much worse because of the establishment of Extended Area Service (EAS) between Irving and Dallas in late 1958.

EAS Brings Problems

Irving wanted EAS and wanted it badly. In order to provide this service, many meetings and negotiations with both the Bell company and Irving city officials were necessary—as well as a plant expenditure of over a million dollars. The company was applauded for providing this service. But, EAS helped bring on the service problem. Here's how:

E.H. Utzman, commercial superintendent of the Southwestern States Telephone Co., explains to Irving employes details of the company's expansion and improvement program. The map being used by Mr. Utzman was later moved to the lobby of the Irving business office.

When calls to and from Dallas were charged as toll calls, traffic was moderate. As an example, during October 1958, 120,000 calls were made from Irving to Dallas and 72,000 from Dallas to Irving—a total of 192,000 calls both ways.

Once EAS was established, traffic was *multiplied nine times*—a total of 1,723,000 EAS calls in January, 1960. The rate of increase was more than twice the national average for such service. The result was heavier telephone usage, more busy lines, and growing dissatisfaction with four-party service.

Some Negative Facts

The significant negative facts about the Irving situation were surmised in early 1960 as follows:

(1) Irving residents did not consider telephone service adequate to their needs or their wants.

(2) They considered the telephone company's attitude "uncooperative", even by some as "hostile".

(3) They had complained repeatedly both to the Southwestern States company's Irving office and Brownwood (Tex.) general offices.

(4) Most of the actively dissatisfied customers were aware that Irving service was not provided by the same telephone company (Southwestern Bell Telephone Co.) that served Dallas. The impression seemed to be that Irving service came from a "smaller" company, a "local" company without the resources, experience or skills of the big city telephone companies.

(5) Irving service was contrasted with the *best* telephone service in Dallas, rarely with Bell-operated suburbs with growing pains similar to Irving.

(6) The introduction of Extended Area Service between Irving and Dallas in 1958 was a definite triumph for the telephone company. But, it had largely been forgotten in the face of seemingly critical service problems.

(7) There was little widespread knowledge that the telephone company in Irving was doing anything really tangible to improve the situation.

(8) Irving subscribers had little or no contact with the telephone company other than through bills, complaints, or service calls.

(9) On file were about 1,800 requests for upgrades, nearly all from four-party to private lines.

(10) Irving had more late payments, more temporary disconnects, and more bad checks issued in payment for service than any other community served by Southwestern States.

Positive Elements, Too

Turning things around, there were also positive elements in the Irving service picture:

(1) There were only a handful of requests for initial service which could not be filled immediately—even if on a four-party line basis.

(2) Service was dial with Extended Area Service to Dallas and nearby cities of Farmers Branch, Grand Prairie and Euless.

(3) An Irving resident could probably *dial* more telephones than could

(Continued on page 48)

WESTERN ELECTRIC

MARKER BUOYS indicate the path of a MILS submarine cable as it is pulled from the cable-laying ship. These are the cables that link MILS shore stations to outlying underwater networks of hydrophones.

AND MILS (MISSILE IMPACT LOCATING SYSTEM)

Listening, thousands of miles beyond the coasts of the United States, are the sensitive ears of MILS: the system that hears the ocean impact of missiles, satellites, and nose cones and determines their exact location.

Early in 1956, Western Electric and Bell Telephone Laboratories – because of their long and diverse experience in designing and building communications systems for the Bell System and the Government – were selected for the unusually difficult MILS project.

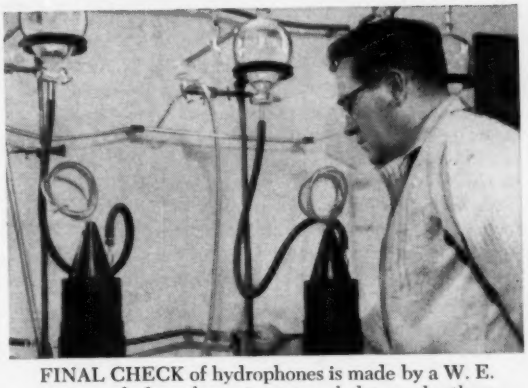
MILS is built around a number of strategically-placed hydrophones (underwater sound receivers), connected through range stations to a control center. The approximate area of a missile impact is determined by those hydrophones which hear the object hit the water. The exact point of impact is then calculated by electronic computers at Cape Canaveral, Florida, or Point Mugu, California – East and West Coast MILS headquarters – from the hydrophone information.

After the basic design of MILS had been developed by Bell Laboratories, Western Electric, as prime contractor, was called upon to apply its experience in submarine cable engineering, oceanography, hydrography and acoustical physics. Installation of the necessary cable and hydrophones was accomplished through the joint efforts of Western Electric's Military Engineering Service and the U. S. Navy.

The success of MILS was possible only because of the coordinated efforts of the Navy, the Bell Telephone System, and hundreds of suppliers and subcontractors. Western Electric is proud to have been selected for this communications project – so vital to our nation's missile and space programs.

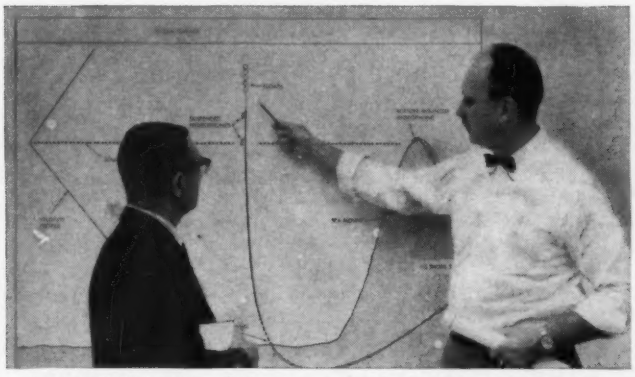
Western Electric

MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM



FINAL CHECK of hydrophones is made by a W. E. engineer before the units are sealed to make them air- and water-tight. These underwater "mikes" and other communications equipment were made for Project MILS at W. E.'s North Carolina Works.

AT THE BOTTOM of the Atlantic Ocean a Western Electric scuba diver swims across a trench, surveying a suitable spot to anchor a MILS submarine cable.



HYDROPHONES and the correct depths for these sensitive offshore sound receivers are the subjects being discussed by Bell Telephone Laboratories' underwater acoustics specialist, Sam A. Portaro, and William G. McDaniels, a Western Electric engineer.

RECOVERING HAM, a widely-traveled chimp (he went over 150 miles into outer space), is one of over 200 successful recoveries already achieved through the use of the Navy's W.E.-directed MILS.

a resident of any other community of comparable size in Texas—and without a toll charge.

(4) Irving residents used their telephones on calls to and from Dallas about twice as frequently as the national (Bell System) average for suburban communities to metropolitan cities.

(5) Irving had grown more than 1600 per cent in the last 10 years—yet telephone service availability (although party line service) had kept pace with demand.

(6) Nearly 2 million dollars had been budgeted for 1960 alone to expand and improve service to set the stage for filling the multitude of upgrade requests.

These were the plus and minus features of telephone service in Irving when a hard look was made at the situation in the first month of 1960.

With the situation objectively evaluated, it was time for action.

Public Relations Goals

Together with R. H. Stewart Mitchell of Tracy-Locke Advertising Agency in Dallas, it was decided that a sound advertising and public relations program could do the following:

(1) Give the company's program of expansion and improvement an obvious shape and direction—a true appearance of constant activity and careful organization that inspired confidence.

(2) Increase materially the public *impact* of improvements in service standards.

(3) Make the delay in upgrading service seem shorter to subscribers.

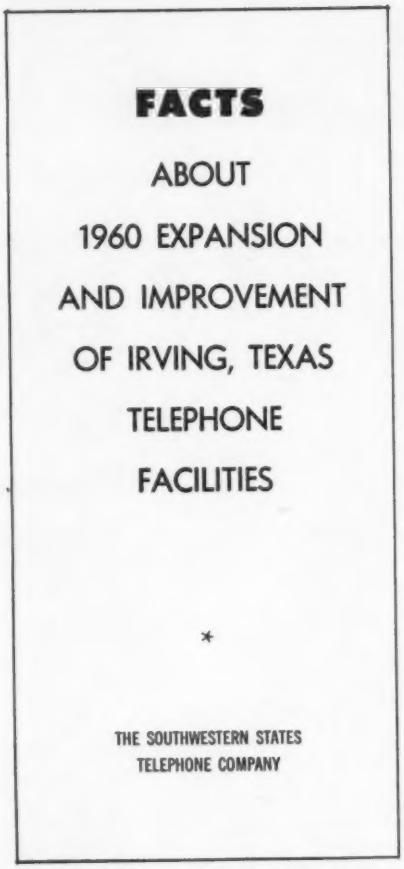
(4) Hasten the day when, as service standards were elevated, the unpleasantness of the past would be forgotten.

In short, a planned public relations program was decided as the final step which, when taken, would make all the other necessary steps more *effective*, more *productive* and more *profitable*.

Year-Program Planned

Stewart Mitchell and his associates at Tracy-Locke were naturals to help give Southwestern States the outside guidance it needed. Mr. Mitchell, a former telephone man, had handled the national advertising program of the United States Independent Telephone Association for J. M. Mathes, Inc., advertising agency in New York since its beginning. Tracy-Locke is the largest advertising agency in the Southwest, with sufficient research, creative and technical facilities to provide the best possible services.

An advertising and public relations campaign was outlined for the entire year in an effort to lay the facts on the table and let Irving subscribers know what was being done to relieve the serious service situation and the resulting bad public relations.



The first step in Southwestern States Co.'s public relations and advertising program in Irving was the distribution of this "facts" booklet to Irving employes. This eight-page booklet related many factors that contributed to the service and public relations problems in Irving, what the company was doing to solve the problems, and described the major expansion projects scheduled, including purpose, facilities, completion dates, costs, etc.

This series of articles will outline—step-by-step—what was done and the results obtained from the campaign.

Before breaking the three-stage advertising and public relations campaign, it was decided to tell the Irving telephone story, as forcefully as possible, to the almost 100 members of the Southwestern States employe team in Irving.

This required several advance preparations.

A pocket-sized booklet, entitled "Facts about 1960 Expansion and Improvement of Irving, Texas, Telephone Facilities" was prepared—solely for Irving employe consumption.

This eight-page booklet began with an explanation of the many factors that contributed to the prevalent public attitude toward telephone service in Irving. The two principal reasons were the tremendous growth of the Irving community and the introduction of Extended Area Service between Irving and Dallas, which greatly increased telephone usage, thereby also causing increasing dissatisfaction with party line service.

Then, the booklet outlined the 1960 construction program. Each project of the expansion program was described as to purpose, location, facilities, completion date, cost, etc., and important dates when major projects would be completed were noted.

But the mere printing of the facts booklet wasn't enough.

Map of Irving Used

An enlarged street map of Irving was prepared showing the area to be served by a second central office (BLackburn 5) and indicating in bright red lines where both aerial and underground cable would be added.

The map, 44 inches long by 40 inches high, was mounted on a large board and was displayed in the Irving business office.

On Mar. 11, the company scheduled the first of what turned out to be several employe indoctrination meetings—meetings at which the entire service problem and the corrective expansion and improvement program were explained in terms understandable to operator, clerk, lineman or repairman.

With Division Manager William P. Esslinger presiding, Commercial Superintendent E. H. Utzman used the large map and other maps in going over the expansion plans in detail. Public Relations Director R. L. Post outlined the advertising and public relations campaign which was to follow within only a few days. Also taking part was Director of Personnel Bill F. Vann. Questions were answered, the "facts" booklets distributed, and the Irving employe group left the meeting wtih the complete story of how the service problem was caused and how it would be remedied—and how all this affected the individual Irving subscriber.

The employe indoctrination meeting was on the eve of the first phase of the unique, extensive advertising-public relations campaign. The stage was now set to take the Irving telephone story to the people.

How the first phase was accomplished with overwhelming success will be covered in next week's issue of TELEPHONY.

(To Be Continued)

PERMANENT SUPPORT

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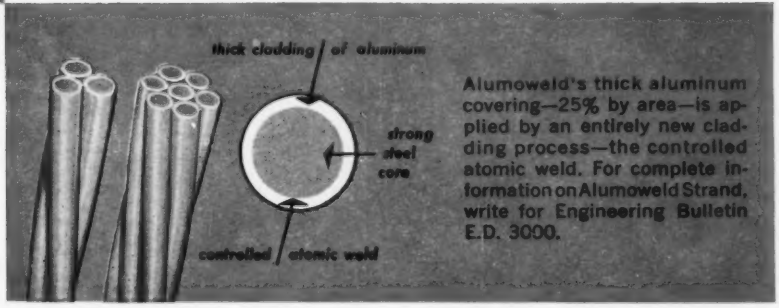
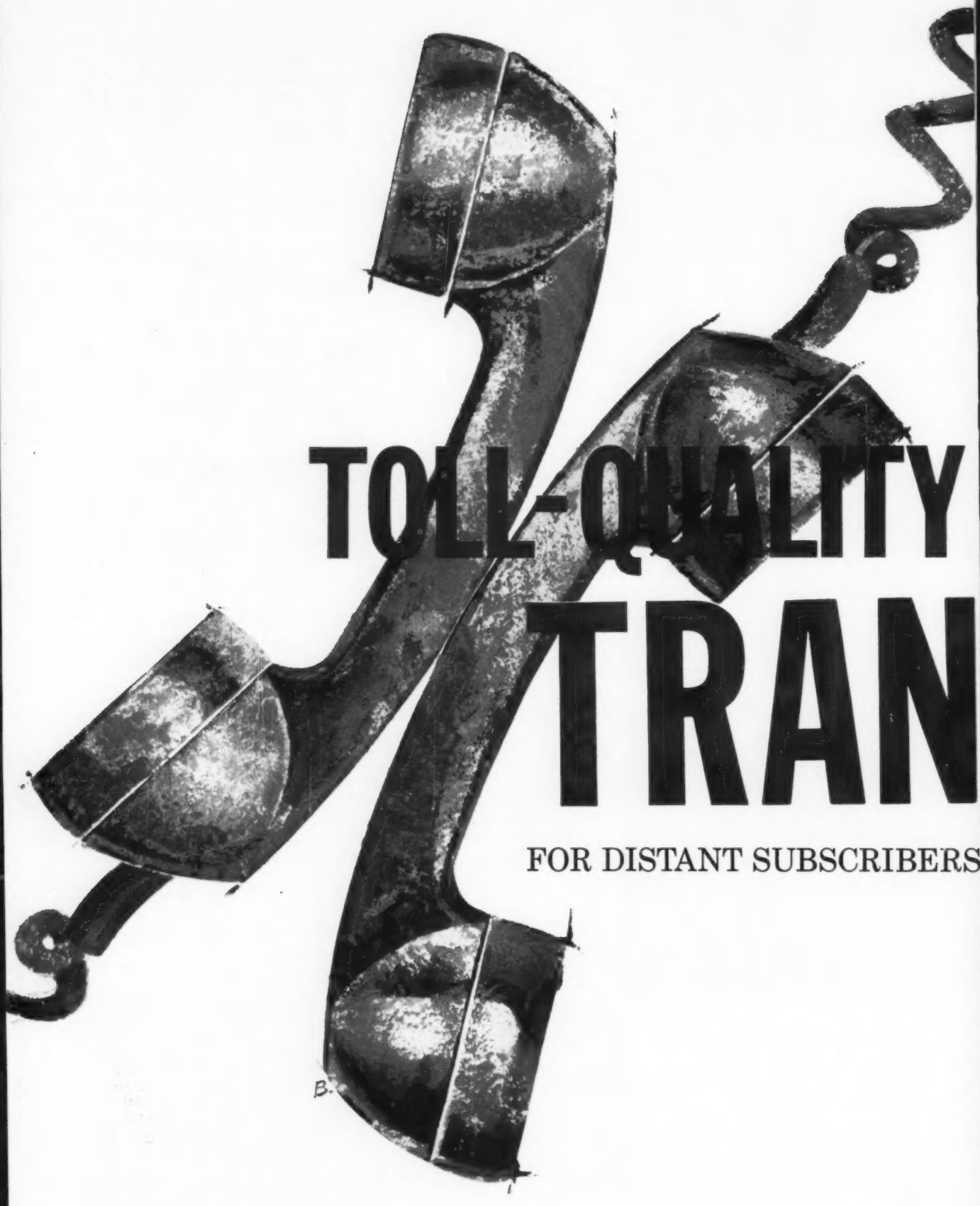


Alumoweld's thick aluminum covering—25% by area—is applied by an entirely new cladding process—the controlled atomic weld. For complete information on Alumoweld Strand, write for Engineering Bulletin E.D. 3000.



TOLL-QUALITY TRAN

FOR DISTANT SUBSCRIBERS

when capital is tied-up, and new service demands exist...

independents start thinking "carrier," in order to get maximum use from existing facilities. And, when you think "carrier," you naturally think "Kellogg"—the leader in carrier design, development and manufacturing. Without a doubt, it's the most complete, and most completely field-tested carrier line in the industry.

ITT Kellogg K-31 and K-32 Carriers offer more exclusive features, yet are lower in cost.

K-31 RURAL SUBSCRIBER CARRIER

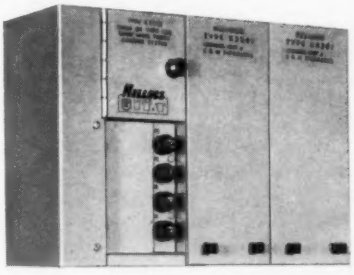
Provides high grade, low cost service between a central office and rural subscribers on single or multi-party lines. Up to 8 channels. Can be utilized to meet future growth needs.

K-32 OPEN WIRE TRUNK CARRIER

Provides low cost EAS or toll service between two central offices. Also up to 8 channels.

And now, system mileage can be *doubled* with one low-cost repeater, *tripled* with two repeaters!

Next time you get caught by sudden new service demands, conserve your capital: find out about carriers, from carrier experts. Call your ITT Kellogg representative or write the ITT Kellogg Regional Office nearest you.



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Basic Principles of Protection

By L. N. MARTIN

IN SECTION 1 of this article (TELEPHONY, Sept. 23), we stated that modern protection practices specify the grounding and bonding of all messengers, guy wires, cable sheaths, and the power company neutral at a terminal pole. It may seem that if a lead cable is supported in galvanized iron rings it would be sufficiently bonded to the messenger. This is not the case.

The surface of the cable is convex and the inside surfaces of the rings are usually more or less convex, therefore, there is only a small point of contact between the cable and the ring. Furthermore, the weight of the cable is not evenly divided among the rings. Due to bowing, the cable will rest lightly in some of the rings and at other rings there will actually be an air gap. This makes a situation favorable to arcing and heating.

Metallic Sheath Cable

The sheath of all metallic sheath cable must be firmly bonded to the messenger not only at terminal poles but at intervals along the lead. The specifications will show how these bonds are made and at what intervals they should be placed.

Some modern cables do not have a metallic outer covering. However, one of the inner layers is metallic, usually consisting of a winding of aluminum ribbon. The specifications will show how to bond this type of cable.

Lead cable (or other cable with a metallic outer sheath) supported by the spinning method will require no further bonding.

Cable Conductors

We now have everything bonded and grounded except the cable conductors. Lightning or power frequently comes in from an open wire line or a long drop and charges a cable pair with a voltage much higher than that of the grounded sheath. This often causes an arc between one or more cable conductors and the sheath. A conductor may be burned in two, causing an open; or two or more conductors may be welded together, causing a short or cross. At other times, the arc melts a hole in the lead sheath through which water soon enters causing a cable failure. This is the usual way in which lightning or power causes cable trouble.

PART 83. BASIC PRINCIPLES OF PROTECTION—Section 2. The preceding article in this series appeared in the Sept. 23 issue.

Now if we had some means of bonding the conductors to the sheath when such accidents occur, but leaving them insulated and ready for use at normal times, we would eliminate this source of trouble. We do have such a device.

Carbon Block Protector

Every telephone man is familiar with the ordinary carbon block protector, more properly called an "open space cutout". All telephone men understand the use of this device for the purpose of discharging a high voltage tc ground. However, probably few have thought of this as a bonding device.

Some years ago the Bell issued instructions that the ground plates of all terminal protectors should be connected to the cable sheath instead of to a ground wire. This was regarded as rank heresy by other companies and by some Bell men. However a little study will show why this is done. The object to be accomplished is to prevent the development of a high voltage between a cable conductor and the cable sheath. These cannot be bonded directly, but can be bonded through an open space cutout. The latter is an open circuit to telephone voltages, but when subjected to higher voltages it breaks down and forms an effective bond between the conductor and the sheath thus preventing a case of cable trouble.

Of course, according to later practices, the ground plate of the protector is both bonded to the sheath and grounded. It may seem that if both the sheath and protector are grounded that no further bonding would be necessary. However, the object to be attained is the shortest possible bond between the protector plate and the cable sheath.

Open space cutouts are made by several manufacturers and are for sale by all the telephone supply houses. There has been much improvement in the mechanical construction of this device. The original protector consisted of two blocks of carbon separated by a thin strip of mica. The mica maintained the required air gap (usually about .003 inch) and had holes or cutouts for the passage of the spark. The original mica separators caused much trouble by splitting or breaking, but in most modern protectors the spacing is mechanically maintained without the use of separators. In some protectors, copper blocks are used in place of carbon. Copper blocks are more often used in protectors where a larger air gap is specified.

Should Clear Itself

The ideal protector should clear itself after it has served its purpose of discharging a high voltage. However, to our knowledge, this feature has never been perfected. Some protectors are better than others in this respect. Near perfection may be obtained by enclosing the protector in a vacuum tube, however, this is too expensive for general use.

On the other hand, in case of a long continued power cross it is desirable to make the contact between the carbon blocks solid and permanent, otherwise the heat of the arc may start a fire. In one form of protector this is accomplished by boring a hole in one of the carbon blocks and filling it with a metal plug which has a low melting point. When the arc continues for sometime, this metal melts and flows between the blocks fusing them

AN EXPANDING LINE OF WIRE TERMINALS and WIRE TERMINAL BLOCKS

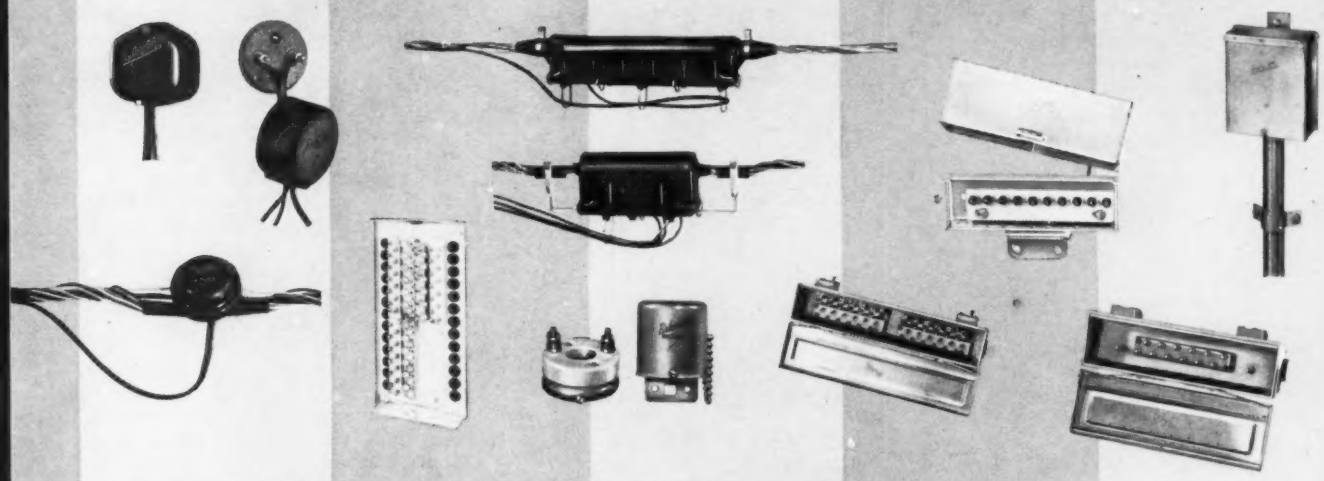
WIRE TERMINALS — Now in 31 catalog numbers

For use at junctions between multiple line wire and drop or bridle wire . . . in sizes 1, 2, 3, 5, 6, 11, 12, 16, 18 and 26 pair. All terminals are self-mounting or supplied with a mounting bracket.

PROTECTED • UNPROTECTED

Protected types use discharge washers or Reliable's Telegard Protector Units.

- For paper or plastic cable protection
- For station protection



WIRE TERMINAL BLOCKS — Now in 28 catalog numbers

For use in building boxes or buried cable housings . . . in sizes 1, 2, 3, 6, 11, 16 or 26 pair.

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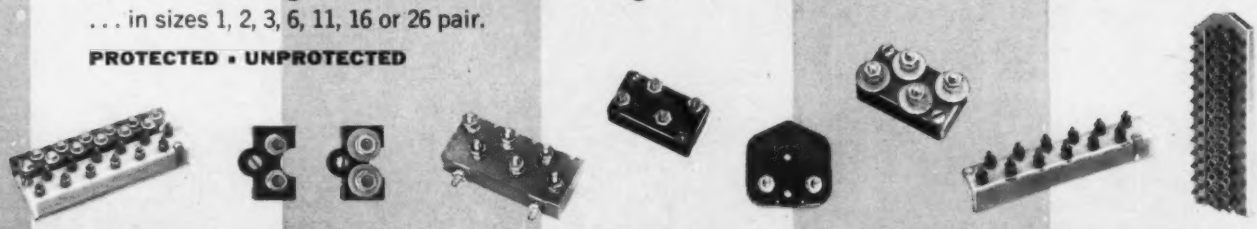

Do you have a particularly difficult installation problem? Our engineering department may be able to help you solve it.

THE TELEGARD UNIT

The Telegard Protector Unit is the heart of Reliable protected Wire Terminals and Wire Terminal Blocks. It is a completely self-contained, weatherproof screw-in unit with replaceable components.

Write for detailed engineering information on Wire Terminals or Wire Terminal Blocks.

Reliable

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together. In another protector, one of the carbon blocks is held in a slot in a porcelain block by glue. Continued heat melts the glue and a spring pushes the carbons together.

In Different Forms

Open space cutouts are made in several different forms for particular uses. These include: Subscriber station protectors, protectors for use on the main frame, strips of protectors for miscellaneous uses, protectors which are an integral part of a cable terminal, and crossarm protectors. The latter consists of a weatherproof mounting containing 10 pairs of protector blocks. This is mounted on the side of the crossarm and a single wire jumper is run from each protector to the corresponding open wire on the crossarm. This protector may also be used to protect drop wires which work out of unprotected terminals. In this case, the protector is mounted on the pole.

At terminals serving rural lines a second protector is often placed on the open wire several spans from the terminal. This protector has a much larger air gap and must have a good ground such as several ground rods in tandem. Its purpose is to absorb the brunt of a heavy charge thus preventing the permanent grounding of the protectors at the terminal.

The Bell uses a crossarm protector for this purpose, but it is equipped with special blocks having a larger air gap. Several types of special protectors are made for this purpose. They are of rugged construction and have large air gaps, which tend to make them self-clearing.

Extra Protection Vital

This extra protection for open wire. or rural distribution wire, is very important and prevents much trouble. The specifications will designate the type of protector to be used, its location, and the method of installation.

The various specifications may differ somewhat as to the amount of protection to be used. This is largely due to economic factors. Theoretically, if one protector on a line is good, two will be better, and three will be still better, etc. However, this idea could be carried to foolish extremes. Absolutely perfect protection is unattainable, therefore, a point is reached where additional protection cannot be justified.

Most Independent companies use protected terminals universally. The strip of protectors is an integral part of these terminals. On the other hand, Bell companies usually use unprotected terminals throughout. Where protection is required by their specifications, crossarm protectors are used. In general, protectors are used at terminals which feed open wire or rural distribution wire. In this case, any drops working out of this terminal must also be protected. Protectors are also used for all drops that are connected to the exchange complement of a composite cable.

Station Protector

The probable reason that the Bell omits the terminal protectors where drops only are involved is that the drops slant downward from the terminal to the station protector. If lightning should strike a drop it is not likely to turn and go up hill to the terminal when it has a clear downward path to the station protector, which is mounted low on the house or in the basement.

The station protector is now specified in the protection practices of all companies. For many years, the station protector consisted of two pairs of carbon blocks and two 7-ampere tubular fuses. In recent years the use of fuses at this point has been discontinued by both the Independent and the Bell companies. The engineers never considered these fuses as a protection against lightning. However, they were considered as of some value in case of a power cross. After the carbons had broken down, and were carrying off the charge, the fuses would blow, thus stopping the arcing and the consequent danger of fire. On the other hand, after a fuse is blown the power voltage (probably 4,000 volts) is left on the upper end of the protector and may endanger the repairman or the public.

COMING FEATURE

Series of articles on "routine testing of both C. O. and outside plant facilities," by a Chief Engineer of a leading Independent company.

MUST READING FOR ALL PLANT AND ENGINEERING PERSONNEL

Protector Location

The best location for the station protector is outside of the building within reach of a person standing on the ground. This location is preferable for two reasons: (1) It is accessible to the repairman without entering the house, and (2) the excessive voltage is discharged to ground before the wires enter the building. A water pipe is the best ground, if one is so located that it may be reached by a direct run of a few feet of ground wire. On the other hand, if the ground wire must make several turns and a long run to reach a water pipe it is better to drive a ground rod directly under the protector.

According to some specifications, station protectors may be omitted at "unexposed" stations. To qualify as an "unexposed" station it must meet the following requirements: The station must be served by a cable which is underground, or buried, all the way from the central office to the subscribers building. This cable must have no aerial branches. The terminal may be inside of the subscribers building, or it may be mounted outside on the wall of the building and the connection to the telephone made by block wiring. However, neither the block cable, nor the block wiring, may cross an alley or other passageway. In the business areas of large cities, and in areas made up of large apartment houses, there will be very many unexposed stations and a large saving in the cost of protectors will result. However, in a small exchange there may be so few unexposed stations that it may be more economical to install protectors at all stations.

Liability Possible

The station protector must never be omitted (except at unexposed stations as discussed above). There may be local ordinances or underwriters' rules on this subject. The company may make itself liable if injury or damage to the subscriber occurs where the protector has been omitted.

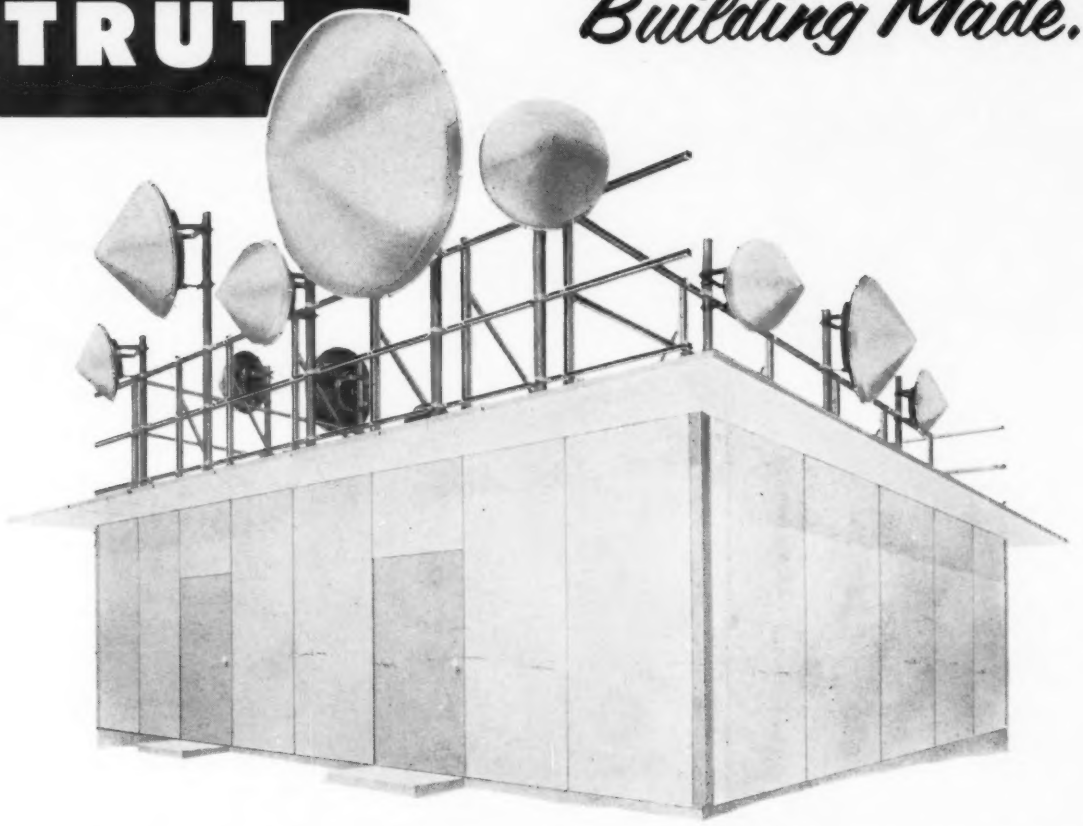
There have been many changes in the protection requirements at cross-boxes where an underground cable is cross-connected to one or more aerial cables. However, these cross-boxes are fast disappearing. It is now common practice to bring a branch of an underground cable up a pole and continue it as aerial cable without a cross-box or protection. If a cross-box is desired, we suggest that the reader consult his practices.

If an underground dip of cable is inserted in an open wire lead (For

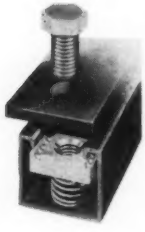
(Continued on page 86)

ARMO-STRUT

The Finest Microwave Building Made....

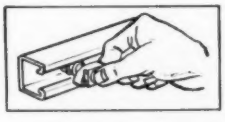


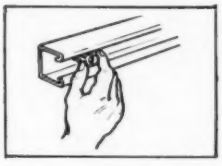
ABSOLUTE TEMPERATURE AND HUMIDITY CONTROL



The Armo-Strut Microwave Building offers two important temperature controls features; three inch superior closed cell polystyrene insulation plus ⅛" panel of asbestos cement in a wide range of colors with acrylic plastic laminated finishes.

The roof with a two foot overhang and exposed "Unistrut" channel joists provides a flexible system for fastening antennas and wave guide supports without the use of bolts through the roof structure. This allows for relocation and permits use of any number of antennas. The roof will support a live load of 30psf and with the building will withstand winds to 100 mph.





The inside exposed "Unistrut" supporting wall column and ceiling joists allow easy fastening or hanging of shelf brackets, electrical fixtures and panels. Installation time is cut in half by the use of "Unistrut" channels and locks. Costly drilling, shooting or welding is eliminated. Interior accessories can be readily moved and rearranged.

Our Leasing Department will arrange short or long term leases for buildings, towers or complete systems.

FOR ADDITIONAL INFORMATION CONTACT:
Floyd H. Haker, President, Armo-Strut Corporation

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PHONE RIVERSIDE 7-0497

DEDICATED TO BETTER HOUSING FOR YOUR MICROWAVE EQUIPMENT

Improving PBX Operation

SERVICE REVIEWS PINPOINT FAULTS

By GILBERT R. BRACKETT

A SERVICE REVIEW, or instructional observation, as it is more commonly called, is one of the most effective procedures available for augmenting a service improvement activity. The data obtained from service reviews are useful, not only in appraising the grade of service given at a PBX, but in pinpointing the particular phases of service at individual PBX switchboards which call for analysis and corrective action.

As a rule, a service review is not intended to picture the work of any individual attendant, but to reflect the general grade of service given by the entire organization of the firm having the PBX facilities to the customers calling into the PBX. In order to correctly interpret the causes of service failures and the corrective action that should be taken, the telephone company's PBX Service Adviser should add the results of her own personal observations to the data disclosed by the service review.

Recognizing Need For Survey

A Service Adviser's occasional personal contacts with a given PBX can usually discover most unsatisfactory service conditions. It could be a poor force condition, an unbalanced switchboard, a poor arrangement or scarcity of equipment, operating technique, tone of service, non-operating duties, or extension user practices which slow up the PBX attendant's attempts to improve the service.

To correctly interpret the observed conditions at a PBX and discuss them effectively and with sureness, the Service Adviser must have a thorough knowledge of service aims and objectives, with a sound understanding of PBX operations for the particular type of facilities provided, and a complete appreciation of the local conditions under which the service is given.

When introducing a service review plan to a customer, the Service Adviser must first recognize the need for the service review, and then proceed to develop and maintain the customer management's and the attendant's interest in a well-conceived, carefully-planned program for service improvement. She should discuss the need for the service review with both management and attendants and obtain their approval to undertake the plan.

No Secret Survey

A Service Adviser should never take a service review study without the full knowledge and approval of both management and attendants. This does not mean that either the PBX management or the attendants should be informed as to the exact time or days the service review will cover. The mere fact that it will be conducted within several days should be enough information. The reason for such a reservation is obvious—a true picture of the service will not develop if the attendants and extension users know just when the observer will be "listening in."

Of course, this kind of secrecy can be kept only if the observing equipment is located on the telephone company's premises. Service reviews taken by listening in with the attendant give a good picture of the actual service originating or terminating at the PBX.

The success of a service review plan depends almost entirely upon the attitude and interest of the PBX management and the attendant. If this is true, every opportunity should be utilized to stimulate their enthusiasm. They must want to use the plan in order to achieve a service that sparkles with courteousness and charm, a service that, in general, maintains high standards in every phase.

Service Must Be Sincere

Seriously, technically good service is not the entire answer to a service improvement program. It is even more important that the service be sincere, as well as attentive, pleasing and cheerful, and sparkling with the "glad-to-serve" spirit. Once the attendant is sold on the idea that any improve-

(Continued on page 62)

PBX INSTRUCTIONAL OBSERVATION RESULTS

TELEPHONE NUMBER

DATE OF OBSERVATION

% ANSWERS OVER 10 SECONDS

% ANSWERS OVER 20 SECONDS

% PLUG INTERVALS OVER 2 SECONDS

EXT. STA. ANS. AVERAGE SECONDS

EXT. STA. ANS. % OVER 30 SECONDS

% PROG. REPORTS DEL. OVER 60 SEC.

% EXTENSION FAILED TO IDENTIFY

% CALLS AFFECTED BY IMP. HANDLING

% AFFECTED BY ATT'S ERRORS

% FAILS TO ANS. WITH ID. PHASE

% FAILS TO ACK. NO EXT. ANS. 10 SEC.

% AFF. BY MISC. IRREGULARITIES

% EXTENSION STATION REACHED

% EXTENSION STA. NOT REACHED-BUSY

% EST. STA. NOT REACHED-DA OR DW

% CALLS FOR OR HANDLED BY ATTD.

% ABANDONED

VACANT

NUMBER OF INCOMING CALLS OBS.

TYPE

FIRM NAME

TEL. NO. ADDRESS NO. POS.

J F M A M J J A S O N D

10 20 30 40 50 60 70

TYPIST PLEASE NOTE — START ALL TYPING AT SAME POINT OR SCALE. THEN REMOVE THIS STUB. BE SURE YOU HAVE A WELL INKED RIBBON. CARE USED IN TYPING WILL IMPROVE REFERENCE DURING THE ENTIRE LIFE OF THE INDEX. TRY A FEW IN THE POCKETS TO SEE HOW THEY LOOK BEFORE TYPING THE ENTIRE LIST.

ACME VISIBLE RECORDS, INC.

CROZET, VIRGINIA

PRINTED IN U.S.A.

Fig. 1. Form for instructional observation results.

We can prove it!

Mail this card NOW for new information on cutting transportation costs!

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PERMIT NO. 36
LINCOLN,
NEBRASKA

BUSINESS REPLY MAIL
No Postage Stamp Necessary if Mailed in United States

Postage will be paid by

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Lincoln 1, Nebr.

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900 No. 21st Lincoln, Nebraska
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☐ Truckster Cost Analysis Report and Literature

☐ I am considering using a Truckster for _____ .Send available "in-use" material on this application.

NAME _____

TITLE _____

FIRM NAME _____

ADDRESS _____

CITY _____ ZONE _____

STATE _____

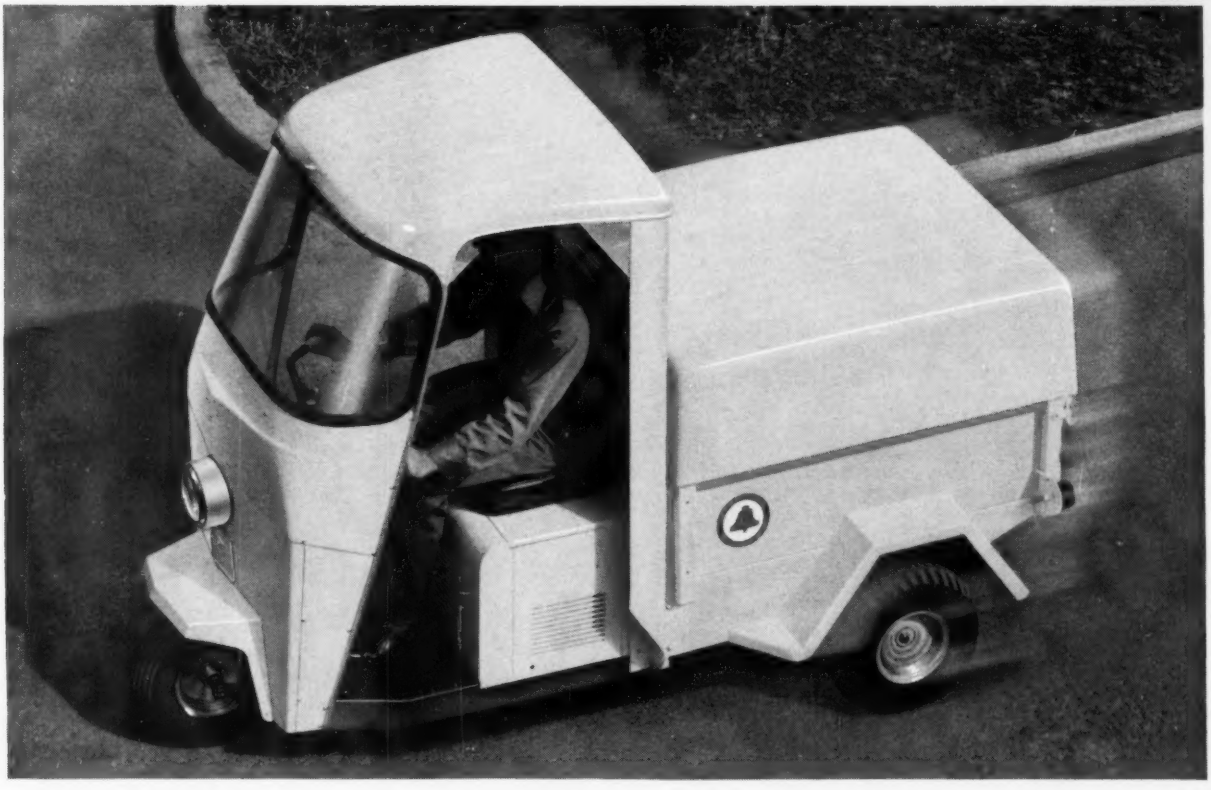
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

*If you own, rent or use light vehicles either on-the-street or in-plant... **CUSHMAN**® offers you the lowest cost-per-mile transportation in America today!*

Check card for your FREE copy of TRUCKSTER Cost Analysis Report

Nearest thing yet to cost-free transportation

CUSHMAN TRUCKSTER.



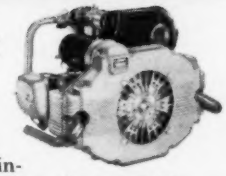
The TRUCKSTER is designed and engineered *specifically* for light hauling applications. It operates for pennies per day and effects important savings on investment, maintenance, taxes and insurance. The Truckster is rugged—takes the strain of over-the-street operation while carrying an 800 pound payload. It's compact and maneuverable—goes many places where other vehicles can't go. Either of two new die-cast aluminum engines—the OMC Twin Super Husky rated at 18 HP or the OMC Super Husky rated at 9 HP —deliver top level efficiency. Want proof of economy? A coast to coast survey of typical Truckster users proves their economy and demonstrates their wide range of utility. Complete results, compiled in condensed form, are available FREE on request. (Just send in the attached postcard.)

MANY TELEPHONE COMPANIES USE THE TRUCKSTER TO . . .

• Service outside booths • Expedite PBX and TWX installation and maintenance • Haul parts and supplies

The **TRUCKSTER** can be factory equipped with a wide range of body accessories to handle a variety of applications (or you may build your own body on the Truckster chassis).

NEW OMC 18 HP TWIN SUPER HUSKY ENGINE



Built with power to spare for all delivery and light hauling applications. Die-cast aluminum; full pressure lubrication; electric starter. Single cylinder 9 HP die-cast aluminum engine also available.

Ask your dealer for FREE demonstration or rush postage-paid postcard for complete information.

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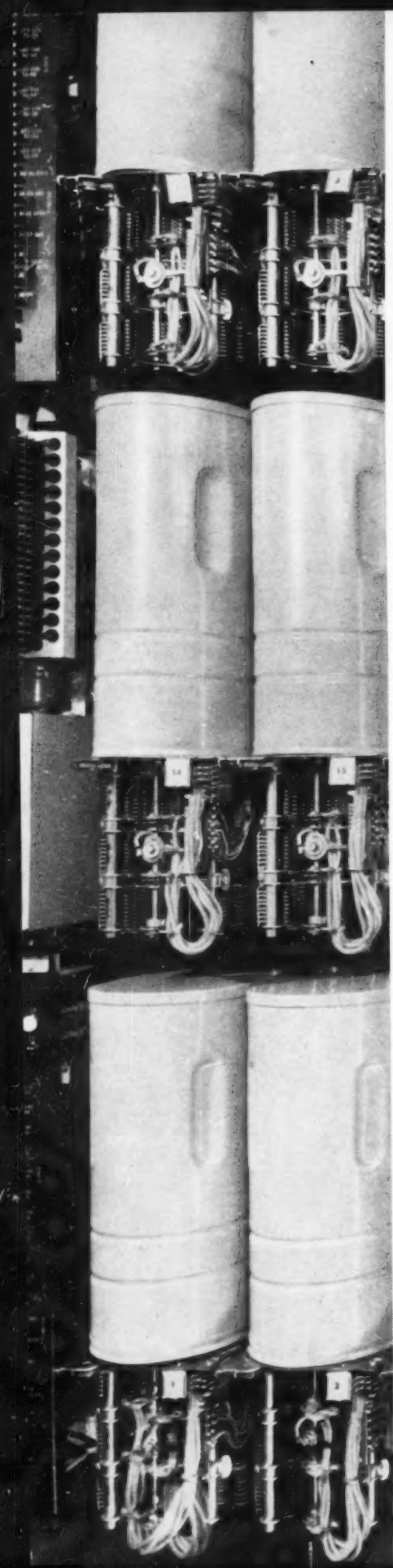


"Yes, Frank...

we can help you finance

Financing is an important consideration to the buyer of dial equipment. That's why George Summerscales* is always ready to explain how to finance the purchase of Strowger Automatic...

Some of George's customers want to borrow money from a local bank. In this case, George helps the customer assemble a strong story which demonstrates Strowger's proven record for quality and dependability—a record that can't be challenged by lending agencies.

Other customers prefer to apply for a loan under the Automatic Electric Finance Plan. In this case, George explains how the plan works and helps the customer make out an application form.

Are you planning a dial conversion? If so, get in touch with us. We'll send *your* AE representative in to help you solve your dial conversion problems. He can help you apply for a local loan—or explain the AE Finance Plan. To contact your AE representative, just write Automatic Electric Sales Corporation, Northlake, Illinois. In Canada, Automatic Electric Sales (Canada) Ltd., 185 Bartley Drive, Toronto 16.

**District Manager, South Central District, Automatic Electric Sales Corp.*

AUTOMATIC ELECTRIC

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

your new dial equipment"

ment in her capabilities, gained through the service review plan, makes her more valuable to her employer and to her company's customers, she will be fully in favor of the program.

The customer management should be impressed with the value of a pleasant, as well as an efficient, telephone service. He should also be informed of the opportunities available to him through the service review plan. The Service Adviser should develop in him an appreciation of the attendant's place in his organization, and so increase his interest in the personnel side of the job. He should know the importance that his attendant has on the tone of service his customers receive, and how she can help to govern the level of business his company will enjoy.

Affects Telephone Company

PBX service that is both efficient and pleasing is a salient factor in the satisfactory over-all telephone service given by the telephone company. As we have often said, since private branch exchange switchboards are involved in the handling of a substantial portion of all telephone calls in a city, the habits and practices of the PBX customer, as he uses his telephone, exert a direct impact on the over-all telephone service given the public.

Good service is a joint responsibility of both telephone company and PBX people. The telephone company needs the latter's help in order to help the PBX customers help themselves. The service review plan is the key that unlocks the door to this help.

It should be remembered that planned activities will assure accomplishment and consequently bring about good results. Planning eliminates lost time; it makes one's work easier; it assures adequate coverage, and

PBX SERVICE OBSERVATION FAILURES — TELEPHONE NUMBER

NAME — ADDRESS

TYPE — 19 — 19

ITEM	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
ANSWERS OVER 20 SEC.																								
PLUG INTERVALS OVER 2 SEC.																								
IMPROPER HANDLING																								
ERRORS																								
FAILS TO ACK.																								
MISCELLANEOUS																								
PROGRESS REP. OVER 60 SEC.																								
EXT. ANSWERS OVER 30 SEC.																								
OFF LINE																								
ADDRESS NAME																								

Fig. 3. Form for keeping a record of service observation failures.

brings about success in reaching a goal or objective. The PBX Service Adviser should give careful attention and plan properly, with the customer's needs and requirements as objectives, when programming a service review. Good results from a service review depend almost entirely upon the kind of support which customer management can be induced to give the Service Adviser in her efforts to train attendants and extension users.

Caution Must Be Used

Some service reviews bring about interesting sidelights. Some bring about dangerous potentialities which can react unfavorably toward the telephone company and future service reviews. The average PBX attendant is a segment in a vast grapevine message center in most cities. When the telephone company does something out of the ordinary at one PBX, soon every attendant in the city will know of the circumstance. That is why caution must be used in handling certain situations that service reviews uncover.

To illustrate what I mean, I would like to tell you about one service review that was asked for by the president of one of the big insurance companies in a certain city. He had received complaints on the PBX service emanating from his switchboard. Some of his business friends were outspoken in their criticism. He called the telephone company for help. A service review was suggested and permission was given to go ahead.

The reason for poor service showed up at once. It seemed that the oldest attendant in point of service had, at long last, found a boy friend who seemed serious about his attentions toward her. He called her at the board three or four times a day and a long conversation would result each time, tying up a trunk and putting the burden of answering calls on the other already overloaded attendants. There were other minor service deflections of course, but the boy friend was the main cause for the complaints directed at the service.

Training Course Answer

It was a delicate situation. No doubt

SUB. REP. — TITLE — HOURS OPERATED — MTG. M.

CHIEF OPR. — BD. ROOM NO. — TOTAL ATTENDANTS

ATTENDANTS

BUSINESS — BUSY SEASON — BUSY HOURS

DATE INSTAL. ED.	TYPE	POS. INST.	POS. OCC.	TRUNKS	WORKING	EQUIPPED	ULTIMATE
				2-WAY			
				IN-ONLY			
				OUT-ONLY			
				TOTAL			

TOTAL EXTENSIONS — SPARE JACKS — EXT. ON PREM. — EXT. OFF PREM. — DIAL

TIE LINES — SPARE JACKS — L. D. TERM.

CORD PRS. NO. — VARI-COLORED — THRU SUP.

SPEC. EQUIPMENT

NIGHT CONNECTIONS — NIGHT LISTINGS

BD. LOCATION SATISFACTORY — ATT'D AUX. DUTIES

REMARKS

NAME — ADDRESS — TEL. NO. — J F M A M J J A S O N D

P. B. X. RECORD

PEG COUNT DATA

DATE — DAY | BH

TOTAL CALLS

TRAFFIC STUDIES

RECORD OF VISITS

DATE — INSTR. — VISIT FOR

Fig. 2. Envelope type of form for keeping records on a particular PBX. Shown here is the face (left) and the back of the envelope.

Pioneers in

CONTINUOUS FEED PRESSURE SYSTEMS & MAINTENANCE EQUIPMENT

AUTOMATIC DESICCANT DEHYDRATORS MODEL "RC" SERIES

These are completely automatic units with an air receiver and intermittently running compressor. Many safety features are provided.

Model	Capacity
RC	750 SCFD
RCA	1500 SCFD
RCH	3000 SCFD

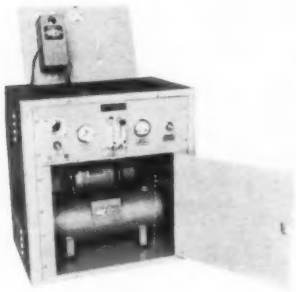
Write for Bulletin No. RC-1-61

AUTOMATIC REFRIGERATION DEHYDRATORS MODEL "FD" SERIES

These are completely automatic units with an air receiver and intermittently running compressor. Many safety features are provided.

Model	Capacity
FDL	750 SCFD
FDM	1500 SCFD
FDH	3000 SCFD

Write for Bulletin No. FD-1-61



MICRO-WAVE & CDO DRYER

Available in two sizes:

Model MWD-200
Model MWD-350

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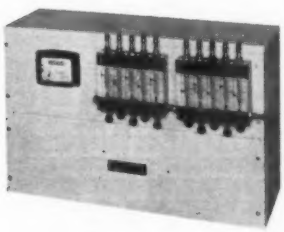
CABLE REEL PRESSURE ALARM PART NO. 8279

Used when cable is plowed in under pressure. When cable sheath is damaged in process of plowing in, the alarm will sound indicating damage of sheath and location can be marked and damages repaired.

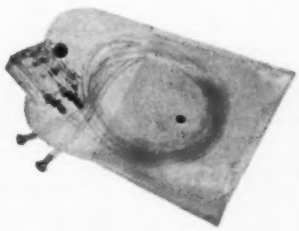
Write for Bulletin No. 8279-1-61



FLOW METER PANEL PART NO. FMP 10

Wall mounted, gives visual reference of how much each cable is consuming plus a volume record meter for the total output of the unit. Each individual flow meter has manual shut-off valve.

Write for Bulletin No. FMP 10-1-61



AIR FLOW INDICATOR PART NO. 8177

An invaluable accessory for use in locating leaks in telephone cables under air pressure—comes in its own plastic case. Many other accessories and plastic air supply lines are available for pressurizing systems.

Write for Bulletin No. 8177-1-61

S&G MFG. CORP.

S&G

jobs would be lost, and the Service Adviser didn't want that. She visited the PBX management and told them she had found the trouble, but it was nothing that could not be cured if the attendants would be permitted to attend the telephone company's PBX training quarters for a review of operating practices. The PBX management agreed to the plan.

Once in the training room, each attendant was given the same treatment. They were told candidly about the effect on service of the time spent on personal talks over the switchboard. It was inferred that the observer had not recognized the voice of the "lovelorn" young lady. The results of such a practice were emphasized and each attendant was told how their president had requested the service review to determine what had suddenly gone wrong with their telephone service. The Service Adviser told them their management knew nothing about what had been discovered and would not know so long as the practice was discontinued and service was improved.

A week or so later the Service Adviser again visited the PBX management. The president was delighted. He had already received compliments on the rejuvenation of his PBX service. The attendants smiled in a friendly way as the Service Adviser repeated the president's acknowledgement of the good service that then prevailed.

How many calls should be observed when making a service review? Is there a grading system that can give an attendant some idea of the job she is doing? The answer is "yes" to both questions. Some Service Advisers may wish to make the survey a more severe test of accomplishments. The tables given below are a suggested observation schedule and a grading system (some advisers may wish to moderate the tables):

OBSERVATION SCHEDULE

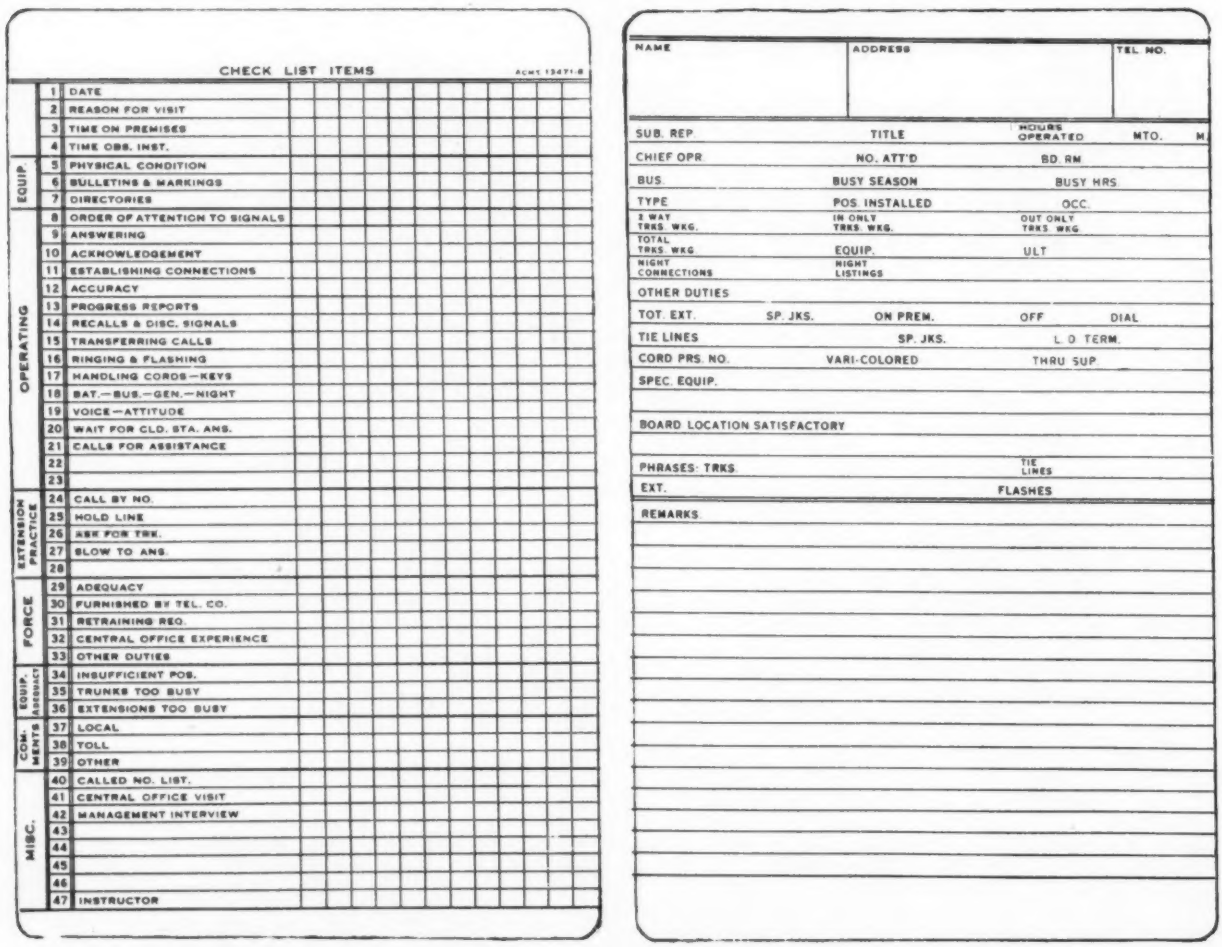
Type of PBX	Normal number of Calls Observed
One position manual	20 to 25
One position Dial	25 to 30
Two position manual	25 to 30
Two position or larger dial	50 to 75
Three position or larger manual	50 to 75

GRADING SYSTEM

In grading an observation, each failure during the survey may be weighed in the following manner:

Failure	Points Lost
Plug-in	2
Trunk answer over 20 seconds	1
Failure to answer with identifying phrase	2
Failure to acknowledge order	2
Recall over 10 seconds	2
Miscellaneous irregularities	1
Wrong numbers - errors	6
Extension answer over 30 seconds	1
Toll calls released due to customer	2

(Continued on page 98)



CHECK LIST ITEMS

EQUIP.	1	DATE
	2	REASON FOR VISIT
	3	TIME ON PREMISES
	4	TIME OBS. INST.
	5	PHYSICAL CONDITION
	6	BULLETINS & MARKINGS
	7	DIRECTORIES
OPERATING	8	ORDER OF ATTENTION TO SIGNALS
	9	ANSWERING
	10	ACKNOWLEDGEMENT
	11	ESTABLISHING CONNECTIONS
	12	ACCURACY
	13	PROGRESS REPORTS
	14	RECALLS & DISC. SIGNALS
	15	TRANSFERRING CALLS
	16	RINGING & FLASHING
	17	HANDLING CORDS—KEYS
	18	BAT.—BUS.—GEN.—NIGHT
	19	VOICE—ATTITUDE
	20	WAIT FOR CLD. STA. ANS.
	21	CALLS FOR ASSISTANCE
	22	
	23	
EXTENSION PRACTICE	24	CALL BY NO.
	25	HOLD LINE
	26	ASK FOR TRK.
	27	SLOW TO ANS.
	28	
FORCE	29	ADEQUACY
	30	FURNISHED BY TEL. CO.
	31	RETRAINING REQ.
	32	CENTRAL OFFICE EXPERIENCE
	33	OTHER DUTIES
EQUIP. INADEQUACY	34	INSUFFICIENT POS.
	35	TRUNKS TOO BUSY
	36	EXTENSIONS TOO BUSY
COMMENTS	37	LOCAL
	38	TOLL
	39	OTHER
MISC.	40	CALLED NO. LIST.
	41	CENTRAL OFFICE VISIT
	42	MANAGEMENT INTERVIEW
	43	
	44	
	45	
	46	
	47	INSTRUCTOR

NAME | ADDRESS | TEL. NO.

SUB. REP. | TITLE | HOURS OPERATED | MTO. | M.

CHIEF OPR. | NO. ATT'D | BD. RM.

BUS. | BUSY SEASON | BUSY HRS.

TYPE | POS. INSTALLED | OCC.

2 WAY TRKS. WKG. | IN ONLY TRKS. WKG. | OUT ONLY TRKS. WKG.

TOTAL TRKS. WKG. | EQUIP. | ULT.

NIGHT CONNECTIONS | NIGHT LISTINGS

OTHER DUTIES

TOT. EXT. | SP. JKS. | ON PREM. | OFF | DIAL

TIE LINES | SP. JKS. | L. D. TERM.

CORD PRS. NO. | VARI-COLORED | THRU SUP.

SPEC. EQUIP.

BOARD LOCATION SATISFACTORY

PHRASES: TRKS. | TIE LINES

EXT. | FLASHES

REMARKS

Fig. 4. Form providing checklist of PBX items to be looked into by Service Adviser. Reverse side of form is for data pertaining to the physical makeup of the PBX.

TRANSPOSITION PROBLEMS?

Hubbard has the answer!

Whatever your transposition problem may involve there is a bracket in Hubbard's complete line specifically designed to fit the job. These Hubbard transposition brackets...from the standard under arm single circuit style to the newest precisely balanced point types ...are easy to install, give low cost, trouble-free service under the most adverse operating conditions.

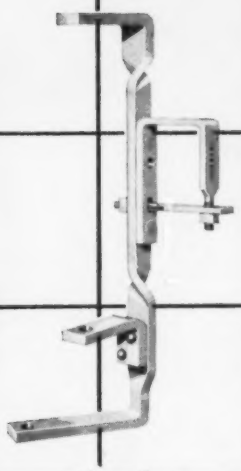
Hubbard's complete line of Hardware for the Telephone Industry is carried in stock nationally by more than 300 distributors...firms whose business it is to know and service local needs. Call your Hubbard distributor for his recommendations on your line construction and maintenance needs.

HUBBARD

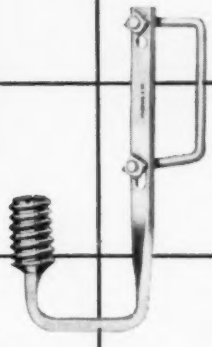
HUBBARD COMPANY • 5401 ROOSEVELT ROAD • CHICAGO 50, ILLINOIS

LIVE BETTER ELECTRICALLY

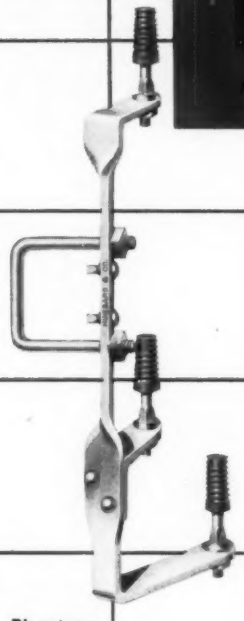
One Piece Phantom Type



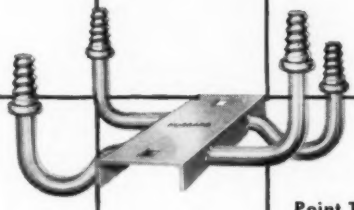
Long Span Phantom Type



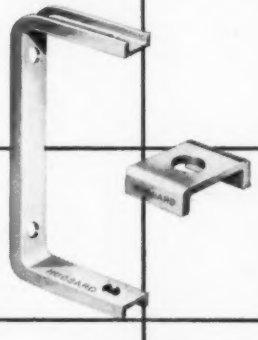
Single Point Strap Type



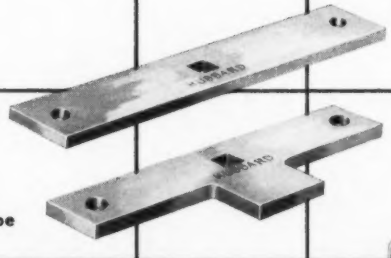
Phantom Pin Type



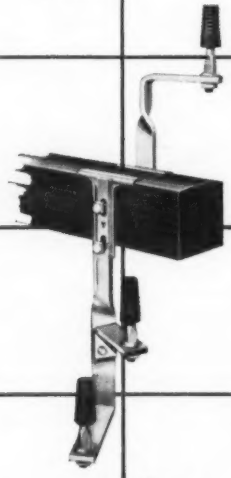
Point Type



Pole Type



Tandem Type



Two Piece Phantom Type

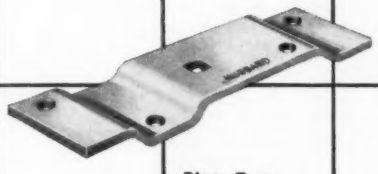
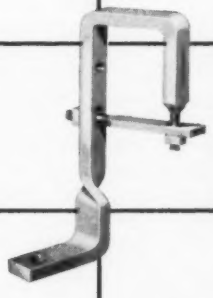


Plate Type

Standard Telephone Type



Long Span Type

Dedication to Service

Theme of S.C. Convention

By RAY BLAIN

THE 27TH ANNUAL convention of the South Carolina Telephone Association convened Oct. 21 and 22 at the Clemson House in Clemson.

President S. S. Helmly of Monck's Corners, in his opening remarks, stated: "Our legend, 'Forward with South Carolina', has been revised and brought up-to-date, and is now titled: 'Dedication to Service'."

According to Mr. Helmly, these facts in the history of Independent telephony in South Carolina from 1945 to 1960 indicate unprecedented progress:

	1945	1960
Telephones in service	26,238	139,100
Number of dial telephones	6,060	138,535
Per cent dial telephones	23 per cent	99 per cent
Independent exchanges	85	125
Exchanges on dial operation	12	122
Per cent dial exchanges	14 per cent	98 per cent
Interconnected telephones in South Carolina	122,838	582,200
Telephones served by Independents	26,238	139,100
Per cent served by Independent telephones	21.2 per cent	23.9 per cent

Thus it is seen, explained Mr. Helmly, that "the heavy demands for more and better telephone service since the end of World War II have been met satisfactorily by the S.C. Independent operating companies. New industry is constantly bringing more people into the state; and undeveloped areas are fast becoming thriving communities.

"The Independents have built hundreds of miles of pole lines carrying cable and wires to once isolated sections. Thousands of dollars have been invested in new central office equipment, buildings and countless other items necessary to maintain the required high quality of service. Additional plant investments in 1960 alone were $6,892,659. This is an obvious indication that the Independent companies are determined to provide the service demanded by their most exacting subscribers.

"Advances in telephone technology are being made in the state at a rapid pace. Innovations such as educational television facilities, expanded microwave networks, data transmission facilities, and others yet to come, are just a sample of the Independents' faith in South Carolina.

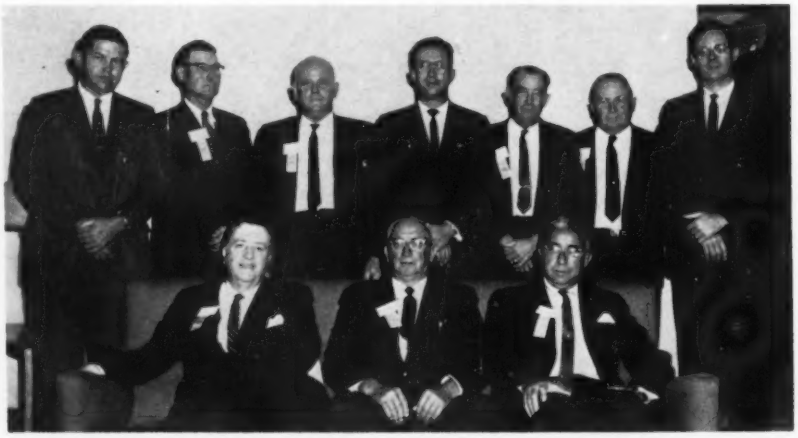
"With an alert Independent association, sound management, modern equipment, well-trained personnel, good regulation, public support, and the ability to attract necessary capital, South Carolina Independent telephone companies" expect to continue to meet the state's record-breaking growth demands, summed up Mr. Helmly.

The convention was welcomed by President R. C. Edwards of Clemson College, who spoke of Southern Bell Telephone Co.'s arrangement with Clemson, dating from 1957, to bring their engineers back to the campus for a refresher course. He indicated that Clemson will endeavor to continue to provide the best in engineering education.

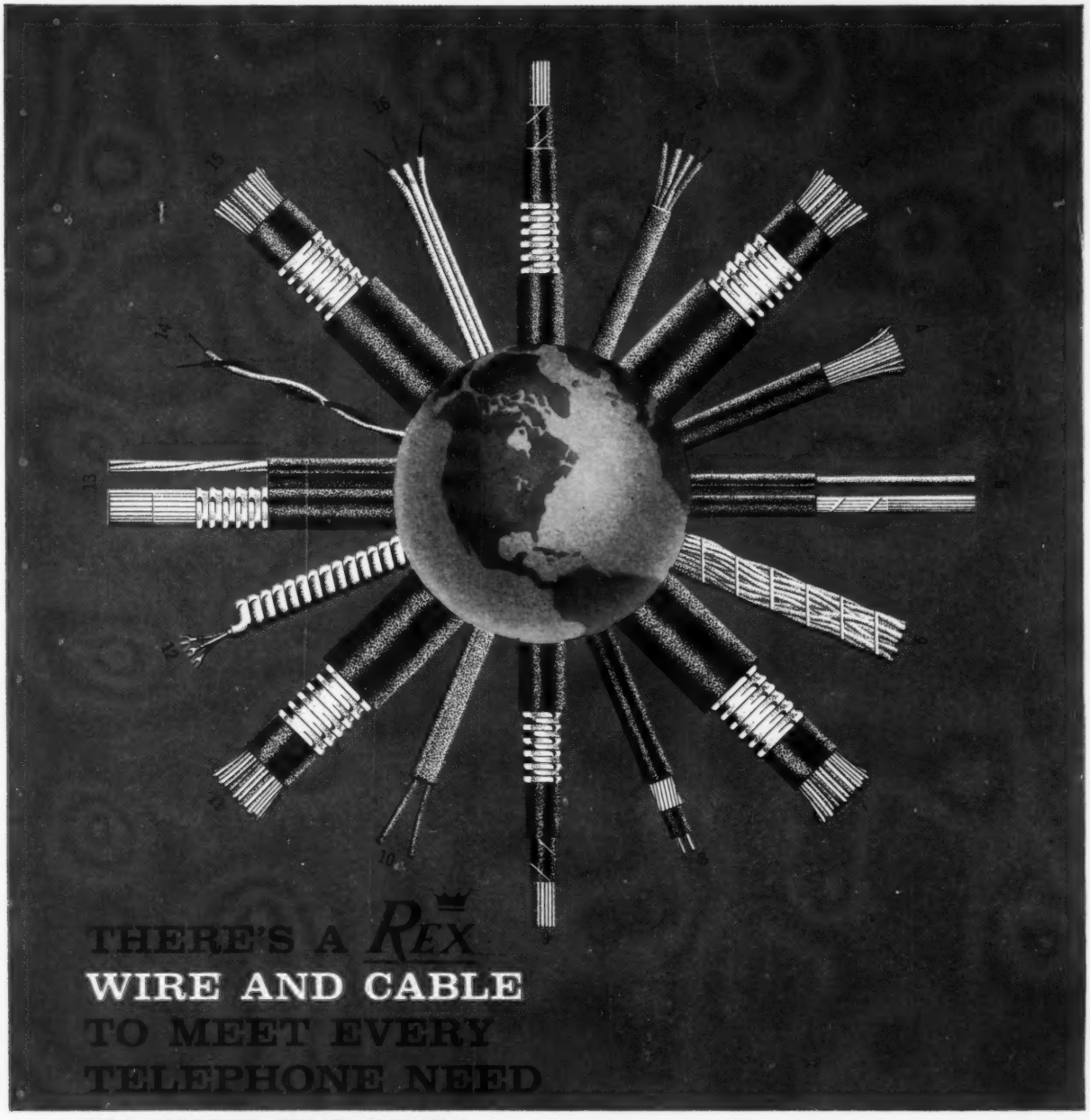
Frank G. LaPrade, of Martinsville, Va., president of the United States Independent Telephone Association, in his address before the association, asked: "How many times have you heard it said: 'It must be nice to work for a monopoly, with no competition to worry about?' How many times have you heard that?

"It is a hard one to answer. We have had no direct competition for our basic service during this century. We have been the only supplier of telephone service in each of our territories. Of course, we have always had other kinds of competition—competition for the investor's dollar, competition for able employes, competition for a share of the family budget. But little or no direct competition—until now.

"Now the situation is different. The next time you hear that remark about



South Carolina Independent Telephone Association's board of directors serving from 1961-64. Seated (left to right): T. Carter Thomasson of Lancaster; S. S. Helmly of Monck's Corner, president; and George Thompson of Southern Pines, N.C. Standing (left to right): E. W. Hart of Hemingway; Lewis Thompson of Abbeville; R. D. Coker of Simpsonville; C. B. Barksdale Jr. of Greenwood, vice-president; H. W. Askins of Chesnee; A. O. Bolen of Swansea; and F. S. Barnes Jr. of Rock Hill. R. E. Seymour of Greenwood, the treasurer; and J. M. Barnes of Rock Hill, the secretary, were absent when photo was taken as were Charles Bell of Chester and Joe Winn of Sumter.



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3	ADCP	Aerial Exchange Cable	REA-PE-22
4	D	Inside Wiring Cable	—
5	8RDW	Figure 8 Rural Distribution Wire	—
6	RDW	Rural Distribution Wire	REA-PE-15
7	ADCP	Aerial Exchange Cable	REA-PE-22
8	PBW	One Pair Armored Burial Wire	REA-PE-24

No.	Cat. No.	Type	Specification
9	DBCP	Direct Burial Exchange Cable	REA-PE-23
10	OPDW	One Pair Aerial Distribution Wire	REA-PE-17
11	ADCP	Aerial Exchange Cable	REA-PE-22
12	—	Retractile Cords	—
13	AS48	Figure 8 Aerial Exchange Cable	—
14	IP	Inside Station Wire	—
15	ADCP	Aerial Exchange Cable	REA-PE-22
16	IPL	Parallel Inside Station Wire	—

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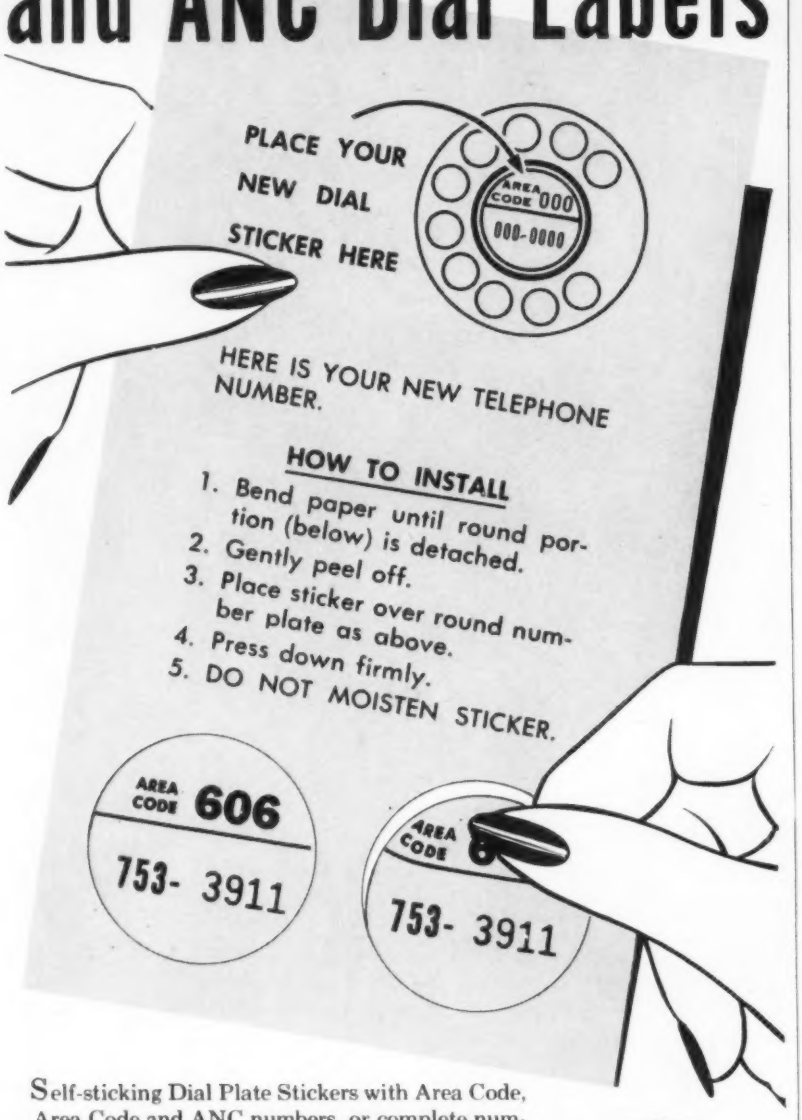
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During South Carolina Independent Telephone Association's convention, R. E. Seymour (left) of Greenwood, treasurer; and John M. Barnes of Rock Hill, association's secretary, exchanged views.

our monopolistic position, you will have a ready answer—'Today we are in direct competition.' No longer can we simply say we are in the 'telephone business.' Today, our business covers a much broader field. We're in the communications business.

"The entire concept of communications—personal and business—is changing fast," said Mr. LaPrade. "Almost every day, new developments and techniques are being born. The FCC's confirmation of a controversial policy threw wide open the area of business long distance communication service. This decision makes it possible for any business man to build his own microwave system, which he can buy from any one of a dozen or so manufacturers. Between Jan. 1, 1960 and May 1, 1961, private system miles, planned or in service, increased by 23 per cent—from 35,000 to 43,000 miles. And this was during a relatively slow period," he pointed out.

The USITA leader reminded his audience: "We are in contest with people to whom the rough and tumble of competition is the very breath of business life. They are big, strong, aggressive companies that know how to develop good products. They have top-notch research and engineering talent. Our competitors are hard at work developing and selling all kinds of communications services: Home intercommunications systems, data transmission equipment, private microwave, pocket signalling devices, farm intercommunications devices, and many more.

"This fairly recent development simply points up the difficulties which we, in a business which is *regulated*, face in competition with businesses

which are *not regulated*. The situation brings up some real marketing problems for us.

"In answer to this competition, we are developing intelligent, hard-hitting sales organizations. Nowadays, many companies are looking for real salesmen who can work directly and closely with our largest customers to help them develop the ultimate in communications services.

"Generally speaking, private businesses are not likely to build and operate communications systems solely from a proprietary motive. Their primary interest is for a dependable communications service required to meet their needs. However, these needs often embrace wide areas of service, both geographically and technically. These needs we must meet cooperatively and without stint, if we are to give these customers the dependable communications they need.

"The time is not far off," continued Mr. LaPrade. "When business machines will be able to originate calls automatically, as well as answer them automatically. It is expected that in time, data communications will actually exceed in sheer volume the communication of speech."

Turning to what he terms "the most powerful weapon in our arsenal of deterrents to this threat of competition, cooperation," Mr. LaPrade said, "I can think of no better way of illustrating this than to say: *The more you do for, and contribute to, both your state and national associations, the more your associations can accomplish for you.*"

The S.C. association's secretary J. M. Barnes, reported that telephone service is now furnished to the more than 582,200 telephones in South Carolina by 45 different organizations—by six cooperatives, 38 Independent commercial telephone companies, and by one Bell System company.

All of the six cooperatives and the 38 Independent companies are members of the South Carolina Independent Telephone Association. The association has also gained seven additional associate members during the past year. Associate membership has increased to a total of 57 members.

A most interesting report on the progress of educational TV in South Carolina was made by R. Lynn Kalmbach, general manager of the South Carolina Educational Television Center in Columbia. The first stages of a state-wide closed-circuit educational television network are in the second year of operation in South Carolina. Conceived as one way to meet the crucial demands for stepped-up quality in both rural and urban education, the

(Continued on page 91)

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SALES AND SERVICE IN PRINCIPAL CITIES

West Virginians

"Back Off, Take a Look at Trees"

By HELEN HARDIN

WEST VIRGINIA Independent Telephone Association men and women did some serious thinking about the future during their 10th annual convention held on Sept. 25, 26, and 27. Convened at scenic Wilson Lodge in Oglebay Park, Wheeling, this meeting was attended by 150 persons.

In the principal address of the convention program, they were told vividly of the tremendous telephone growth that has taken place in West Virginia, as well as throughout the U.S. and abroad, during the last 16 years. The speaker, R. D. Kingston, commercial director of the General Telephone & Electronics Service Corp., remarked that sometimes, it is difficult in the midst of efforts to keep pace with ever-growing telephone needs, to put what has been done, and what yet needs to be done, in proper perspective.

In effect, telephony is in the midst of a vast communications forest, he said, and often so close to the trees it cannot see them. It needs to "back off and take a look at the trees," he affirmed.

To implement this effort, Mr. Kingston began with the statement that "all of us can take a great deal of pride in the role that the Independent segment of the industry has played in the great expansion of the telephone business. . . (It) has contributed the vital momentum which will make possible the progress of the future—a future which I am convinced will bring a full-scale revolution in the telephone business."

Revolutionizing changes in the economy have indeed been occurring, and among them, are new marketing methods which have affected the entire distribution system of the country. Also, huge sums of money are being spent for research by industry, universities and the government to promote technological expansion.

And while these changes have been molding telephone needs and outlook in the U.S., said the speaker, western Europe, Japan and Latin America have also been undergoing an economic revolution.

But in the face of all this rapid change, to provide more and more service to more and more subscribers, the telephone industry must constantly keep in mind the necessity for solving its problems without causing a major upheaval in the industry.

"How many times," asked Kingston, has the telephone man envied the flexibility of the manufacturing business as he painstakingly planned a dial conversion, or worried about making new equipment compatible, or tried to explain to a community why it would be several years before they could be cut over to dial?"

Underscoring recent telephone growth, the speaker reported that 10 years ago, there were 6,400,000 Independent telephones, representing an investment of $1,100,000,000, and gross revenues of 317 million dollars.

At the end of 1960, there were nearly 11,500,000 Independent telephones, with an investment of 4 billion dollars, and gross revenues of 1 billion dollars.

In 1960 alone, Independent telephone operating companies invested 575 million dollars in new plant, or more than their total investment a few years back. He showed the contrast between investment per telephone in 1950—$172—with that of 1960, amounting to $350.

"If the telephone companies had not seen the job that had to be done, ... and had not done that job, this country's over-all economic growth in recent years simply would not have been possible," said Kingston.

Sounding a note echoed by leaders in Independent telephony, the GT&E executive reminded West Virginians, "Today all of us are in the *communications* business—*a full-range communication business which is built around our ability to get the right information to the right place at the right time.*"

New and expanded telephone services have been developed to meet the needs of American business enterprises which spent nearly 4½ billion dollars in 1960 on communications, mostly, for telephone service, he told the convention. The newest trends in telephone facilities are data and image transmission; and it is estimated that, by 1965, the number of devices and machines transmitting business data over telephone circuits will reach 100,000 which translates into a great future for the individual telephone company!

Two factors cited by Kingston—the increasing need of speed in transmitting information, and the increasing burden of paper work—challenge telephone companies to help provide business with solutions to its communications problems.

Other developments to be considered by the telephone industry are facsimile and telewriting which will play their roles in this economic revolution, he added.

Continuing his sweeping over-view of progress, Kingston said:

> "We in the communications business are going through many far far-reaching changes, and at some

future convention of this association, someone will say, 'that was some revolution, wasn't it!' And when he says it, there will be communications satellites orbiting around the earth, transmitting telephone conversations, television, and business data. . . . .

"The understandable tendency is to look upon a satellite system as supplementary to existing cable and radio circuits, but its real potential exists in its world-wide service—a truly global communications system which would be a vital force in promoting economic progress throughout the world."

Apropos of putting the picture in proper perspective, Kingston injected this thought-provoking question: " . . . Here we are in the communications business, and we pride ourselves on furnishing good service. But we are doing an equally good job of communicating our problems and our objectives throughout our own organizations?

"It means," he said, "learning how to meet our problems effectively and quickly, and it means instilling in everyone the necessity for doing a better job of running their part of the business. . . "

Continued Kingston: "We have spent a little time now and then, looking at the so-called 'bigger picture,' but after all, there are only 24 hours in a day. In the past two or three years, however, businessmen throughout the country have been looking closer than ever before at the 'business climate'—inflation, taxes, foreign competition, and every other factor that influences our operations. This is far more than simply trying to help business. It is a case of trying to help the entire community—the people who own businesses, those who work in them, those who buy their products and services, those who sell to them, and those who are dependent upon them—in fact, *everybody.*"

Telephone leaders throughout the country are setting the pace in community leadership, he said in conclusion, through their activities in industrial development organizations, their work on community projects, their awareness of the importance of good communications to local community progress.

D. C. Dodrill of Laurel Point, outgoing president of the West Virginia Telephone Association, presented a report of his stewardship during the past year; and Robert Minear of Davis, the secretary-treasurer, gave a general report on official matters.

Among other things, Mr. Minear noted that while their state's associa-

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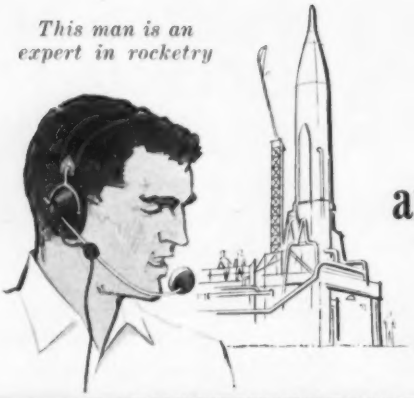

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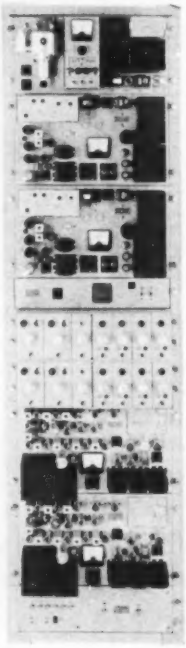

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tion is not large in membership, yet its spirit of hospitality, the friendly interest and sharing of information helpful to all operating companies more than make up for the smaller membership.

During the business meeting of the convention, Ken Bulloch, cable engineer of Anaconda Wire & Cable Co., gave an informative talk on buried plant and figure "8" cable.

The talk on "The Life and Hard Times of a Hillbilly Editor," delivered by J. Franklin Comstock of Richwood, publisher of "The West Virginia Hillbilly," was a cogent one. Mr. Comstock himself is currently identified with a state-wide campaign to put that state's rugged pioneer, the "hillbilly," in his rightful place as the citizen who struggled to build the solid foundations for recent economic growth (see story, this issue, page 110).

West Virginia these days, is flying a banner to lift state-wide morale, Mr. Comstock said. The campaign is heartily approved and endorsed by the state's governor.

Mr. Comstock champions the "hillbilly" in messages appearing in public service advertising placed by a corporate member of the communications industry, the Chesapeake & Potomac Telephone Co. of West Virginia. This campaign, with the slogan, "Look to the Wealth of West Virginia," seeks to make every West Virginian proud of his state's heritage and confident of its future.

In the words of editor Comstock: the hillbilly, who is stubborn, tenacious, and independent, is also—the real backbone of West Virginia. He lives among the trees in the hills, but he knows when it's time for action, and (quoting from the C&P company ad), "Now is the time."

The convention elected the following directors: James C. Crane of Masontown; C. Murrill Colburn of Marlinton; Leroy N. Darling of St. Marys; Delbert C. Dodrill of Laurel Point; Don E. Feaster of Charleston; Ray J. Landon Jr. of Charleston; Robert W. Minear of Davis; Nyle Scholl of Bluefield; and W. Murray Smith of Clay.

Elected as new directors were: Carl Ballentine of Pine Grove; Gerald H. Parks of Davis; and Donald Roush of New Haven.

The directors elected as their officers: President, Mr. Colburn; first vice president, Mr. Feaster; second vice president, Mr. Darling; and as secretary-treasurer, Mr. Minear.

Vital Long View

A politician thinks of the next election; a statesman, of the next generation.

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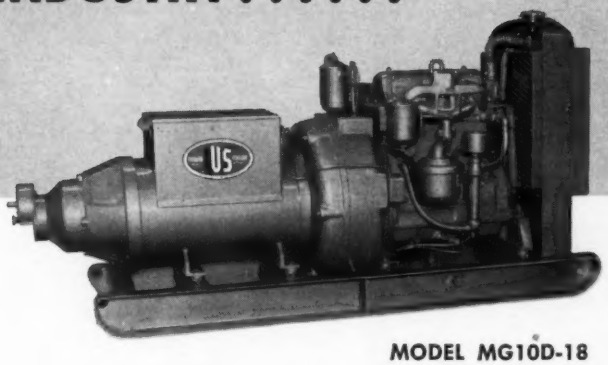

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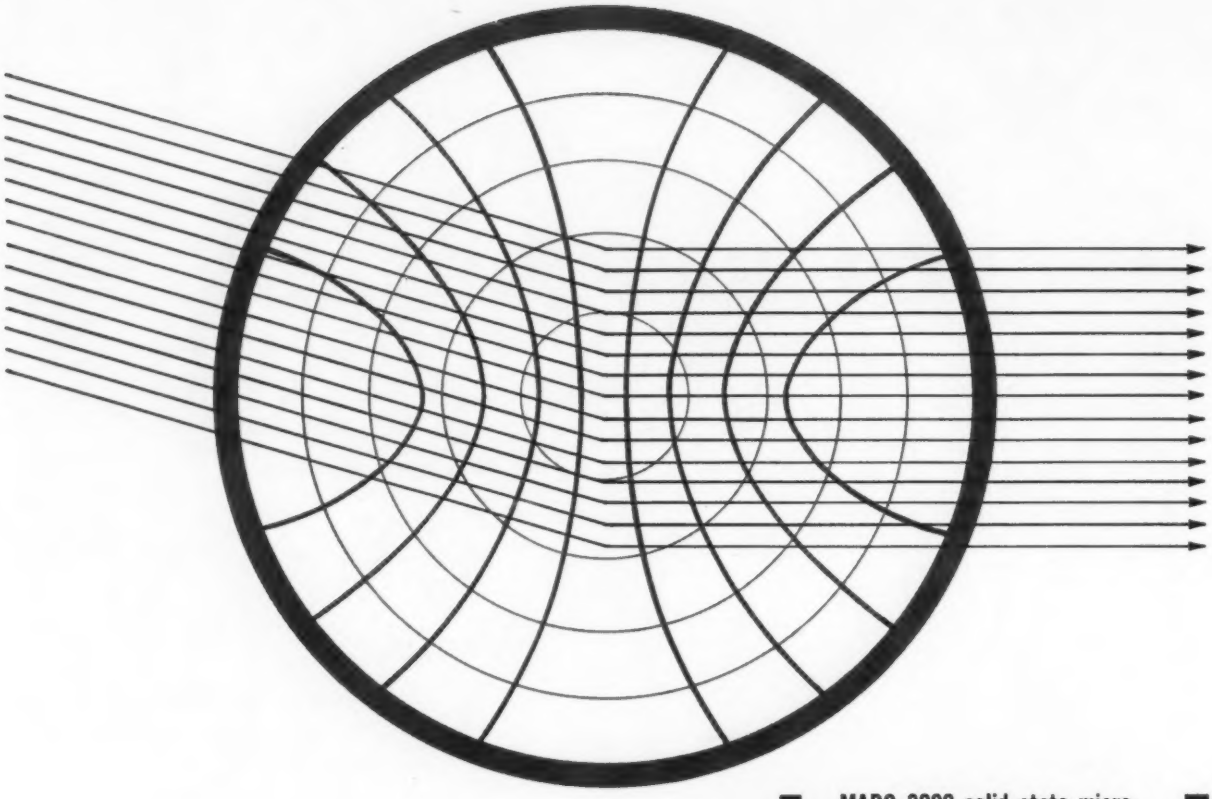

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A MARC alarm/control system, monitoring unattended microwave repeater terminals, can anticipate trouble, pinpoint its location, and initiate immediate corrective action. Among the typical alarm conditions which can be monitored are failure or degredation of RF performance, loss of signal, intruder and approach alarms, power failure, switchover to stand-by, carrier fault (major and minor), and tower light failure. Corrective action is initiated over the control channel.

Standard, off-the-shelf MARC systems are compatible with wire, radio, UHF, VHF, microwave, and carrier communications links, and may be installed without special modification to operate with all transmitters and receivers of conventional manufacture. Depending upon application requirements, MARC equipment is available for multiple-tone, TDM, and interrogation systems. "Order Wire" and other service channel functions are provided as required.

Modular, plug-in units are all-solid-state, and require virtually no maintenance. Power and space requirements are minimal; a typical repeater providing for 64 alarm functions occupies only 3½" of rack space, is powered readily from existing station voltages.

Write for current data sheets on standard MARC systems. Inquiries are invited on special systems.

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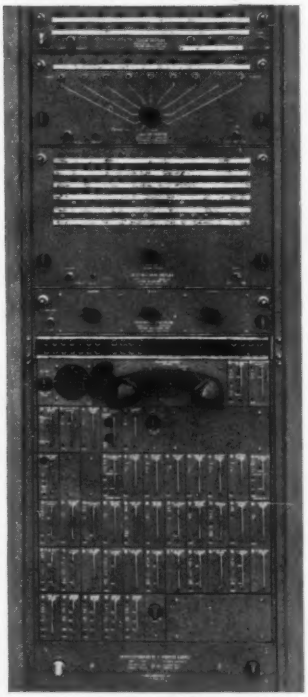
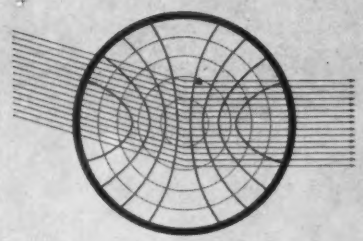
MARC 3000 solid-state microwave and alarm equipment selected to monitor transcontinental microwave system.



Typical master station used by Western Union on their MLD-4B Transcontinental Microwave System.



MARC EQUIPMENT HAS BEEN PURCHASED BY THE FOLLOWING:

Western Union Telegraph Company
New York Bell Telephone Company
Hawaiian Telephone Company
Western Electric Company
Lenkurt Electric Company
Illinois Bell Telephone Company
General Telephone Company of Illinois
U. S. Air Force
Chicago and Northwestern Railroad
Atchison, Topeka, and Santa Fe Railroad
Collins Radio Company
United Telephone Company of Indiana
Raytheon Company
ITT — Kellogg
Union Oil Company
Sun Oil Company
Humble Oil Company
Edgerton, Germeshausen & Grier
American Machine and Foundry
Southern Pacific Company
Naval Ordnance Test Center
Aerojet General Corporation
David Taylor Model Basin, USN
Boeing Aircraft Company
Bristol Company
Radio Corporation of America
Frankford Arsenal, USA
Eglin Air Force Base, USAF
Computer Measurements Corporation

MARC systems purchased by the above companies operate in conjunction with standard microwave communications equipment such as that manufactured by the following:

Raytheon Company
Western Electric Company
Lenkurt Electric Company
Collins Radio Company
Motorola
Philco Corporation

Courts and Commissions

Offer ETV to N.Y. Schools; AT&T Asks FCC for ETV Rates

An educational television system (ETV) is being offered by the New York Telephone Co. (Bell) to school systems throughout New York State. This was made possible recently when the New York Public Service Commission permitted the tariff for local systems submitted by the company to go into effect.

Sales personnel are now making contact with school systems which have indicated an interest in ETV. These inquiries have been received from a number of school systems in Long Island, upstate New York, and Westchester. Company representatives also will visit other school systems in the state.

The offering of ETV service is the end result of work done by a task force of engineers which was created in January, 1961, to prepare for its introduction.

The men were charged with developing specific ETV facilities to provide a high-grade service at the most reasonable cost possible.

ETV of the general type now offered by the company was first put to use in the state in 1958 when eight schools in Cortland, Truxton and Virgil began the system on an experimental basis. Since then, as actual use led to improvements, they have been incorporated into the system.

The average local school system which will be interested in ETV is comprised of eight schools with a total of 100 classrooms and an average of 3,000 students.

The ETV facilities developed by the company can provide up to six simultaneous programs to be sent into classrooms. The number of channels needed will vary anywhere from one to six and is expected to average about three.

One of the vital elements available in the company's ETV plan is the participation feature which enables students and teachers to talk back and forth although not in the same room.

Representatives of the New York State Department of Education who have worked on the Cortland project declared that this ETV system performed efficiently and is very satisfactory from their viewpoint. The ETV system may be had with or without the participation feature at appropriate charges.

Some educators feel that participation is a very desirable feature in an ETV system for both keeping students on their toes and stimulating teachers.

•

Last month the American Telephone & Telegraph Co. filed an interstate educational TV tariff with the Federal Communications Commission which becomes effective Dec. 7, unless suspended.

The offering proposes two classes of multi-channel service: a Local Distribution System providing from one to six channels for educational communities such as school districts and college or university complexes; and Interexchange Systems of one to five channels for the connection of such local systems.

Commercial TV services such as patching spares and television center supervision would not be furnished and trouble clearance would be on a call-out basis.

The subscriber would provide the studio equipment and television viewers; the telephone company would provide the transmission channels between the subscriber's premises on a 24-hour-per-day, seven-days-per-week basis.

The Local Distribution Service between two points less than 25 miles apart would cost $15 per quarter-mile for the first picture and sound channel; $5.00 for the second; $3.00 for the third and fourth; and $2.00 for the fifth and sixth.

Proposed Interexchange system rates, based on an airline mile per month would be $27.50 for the first channel; $12.50 for the second and third; and $10 for the fourth and fifth.

Monthly rates for channel inputs, per source of signal, ranging from $40 for the first channel to $12.50 for the fifth and sixth, are also proposed, as well as channel outputs per receiving location of $7.50 for the first and $5.00 for each of the others.

OK Stock Acquisition in Minn.

The Minnesota Railroad & Warehouse Commission on Nov. 20 gave permission to Irvin R. Johnson, representing a majority of the stockholders in the Lerdal Telephone Co., Inc., to sell the majority of the company's stock to Minnesota Telephone Co., New

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London, Ia. Mr. Johnson had secured proxies from the holders of more than two-thirds of the voting and/or common stock of the Lerdal company.

Asks to Serve in Missouri; Seek Stock Purchase OK

The Missouri Public Service Commission on Dec. 20 is to hear the application of Western Dial Inc., Eldorado Springs, to serve the area in and around Johnson City.

Also in Missouri, the Continental Telephone Co. on Nov. 14 asked the commission for permission to acquire more than 10 per cent of the common stock of the Twin Lakes Telephone Co., Branson.

Ind. PSC Orders General Pay Tolls, Pending Settlement

The Indiana Public Service Commission, making its first ruling in a dispute between Indiana Bell Telephone Co., and General Telephone Co. of Indiana over division of revenues from interchanged toll, on Nov. 17 ordered General to stop withholding monthly payments from Indiana Bell (TELEPHONY, Nov. 18).

In an interim order issued at the request of Indiana Bell, the commission declared that payment by General of Indiana shall begin with all billings on and after Dec. 1. Settlement shall be under the provisions of a 1961 Standard Traffic Agreement between Indiana Bell and other Hoosier Independents, the order stated.

At the same time, the commission denied Indiana Bell's petition for an order requiring immediate payment by General of Indiana of more than 4 million dollars, withheld from Indiana Bell since last spring. General of Indiana has made no payments of interchanged toll revenues to Indiana Bell since last April.

The commission said it has "no authority to enter money judgments nor make retroactive orders" in explaining this denial.

The order, the commission stated, "shall remain in full force and effect until further order of the commission, or until the parties have entered into a written agreement fixing compensation different from that ordered or authorized herein, and such agreement has been submitted and approved by the commission."

The order, as pointed out in a statement of findings accompanying the ruling, established the regulatory body's authority to take action in such a case.

The commission further found General's practices in withholding payments due Indiana Bell "injurious." It said these practices affect Bell and its customers and will, if continued, cause future injury to them.

"Such practices have created an emergency," the commission stated, "and it is necessary in order to prevent future injury to Bell and its customers to alter these practices and to fix just and reasonable practices to be observed and followed in the future until further order of this commission.

"The actions and practices. . . . affect and relate to the joint toll service provided by Bell and General and such actions and practices are found to be unreasonable and unjust."

The commission's findings stated further:

"Under the law, the commission is specifically authorized to act in emergencies and has broad power to issue emergency orders pending the final outcome of proceedings before it.

"Whenever rates or schedules become unreasonable or confiscatory, due to some event which calls for immediate action, the affected utility is entitled to an emergency order. The division of toll revenues between connecting companies is basically connected with rates. If one utility retains an excessive portion, or all of joint revenues, the subscribers of that company are being indirectly subsidized at the expense of the subscribers of the other utility.

"In addition, there is a direct injury to the utility being deprived of revenue, since it would not be receiving a fair return on its

COMING FEATURE

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investment. To require physical connections and the interchange of telephonic facilities without providing a method for reasonable compensation, would constitute the taking of property without just compensation and, and in our opinion, would be unlawful.

"The provisions for emergency rates and services were evidently designed to empower the commission to alter and suspend rates, schedules and orders under emergency conditions for immediate protection of the public utility business or the public interest during the time required by the commission to enable it to establish permanent rates and orders for adequate service.

"Public convenience and necessity requires the continued interconnection of facilities between Bell and General, and the commission will fix reasonable compensation for such interconnection."

The commission also noted that General of Indiana had notified Indiana Bell in 1958 of its intention to terminate the 1956 settlement agreement in effect at that time, but added:

"Permission was neither sought nor obtained of this commission to terminate the said traffic agreements."

However, the commission found, "as of this hearing, the 1961 agreement is more equitable (than the 1956 agreement) and would result in additional benefits to General."

Ask OK to Issue Stock To Acquire N.C. Company

North Carolina Telephone Co., Matthews, asked the North Carolina Utilities Commission on Nov. 22 for authority to issue more than 370,000 additional shares of its common stock.

It said it plans to acquire the Laurel Hill Telephone Co. by issuing 120,000 shares of its stock to Laurel Hill shareholders and to sell 250,000 shares of its stock reportedly to the General Telephone & Electronics Corp.

A price of $1.25 per share was placed on North Carolina telephone stock in both transactions.

The company said it plans to issue another 4,416 shares of stock to raise working capital.

Merger, Loan, Stock Requests Before Missouri Commission

The Missouri Public Service Commission on Nov. 20 received the petition of the Albany Telephone Co. for authority to merge into the Inter-County Telephone Co., Gallatin.

•

A hearing was to have been held on Nov. 22 on the application of the McDonald County Telephone Co., Ander-

Western Electric and Kellogg

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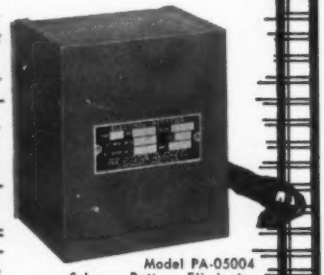

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son, to borrow $125,000 for plant improvements.

•

Also, on Nov. 22, the Farmers Mutual Telephone Co., Maitland, presented both an application for approval of a loan and an application to transfer its assets. In a joint hearing, the Nodaway Valley Telephone Co., Maitland, filed an application for authority to issue stock.

General of Mich. Authorized To Raise Rates $2,478,000

The Michigan Public Service Commission on Nov. 17 authorized General Telephone Co. of Michigan to increase its annual revenues by $2,478,000 (TELEPHONY, Aug. 12). At the first public hearing on its application, the company testified to a requirement of 4 million dollars in increased revenue. At the second hearing, this figure was reduced to 3.2 million dollars due to significant changes in revenue and expense factors in the interim.

In supporting its need for additional revenues, the company cited a substantial improvement and expansion program during the last five years that required expenditure of more than 70 million dollars. In addition, taxes, depreciation, and financing costs increased greatly, causing a depression of earnings.

Company president T. A. Saunders expressed "disappointment" with the smaller figure ordered by the commission. He said, "We feel that the company presented a fair case and demonstrated conclusively the need for 3.2 million dollars in additional annual revenue. While the $2,478,000 authorized will improve earnings, it is substantially less than needed."

Citing a 1961 construction program of approximately 18 million dollars, Mr. Saunders stated, "We will make every effort to maintain our construction program designed to achieve 100 per cent automatic dial operation by the end of 1962, without any substantial change." A schedule of new rates that will create the additional revenue ordered, is under MPSC study.

S W States Asks Arkansas PSC For Bond Issue O.K.

The Southwestern States Telephone Co., Brownwood, Tex., on Nov. 14 requested permission from the Arkansas Public Service Commission to issue 3.5 million dollars worth of bonds to help finance new construction in 1962.

The company plans to spend a total of 9.3 million dollars for construction in Arkansas, Texas, Louisiana and Oklahoma. Of this amount $1,240,000 will be spent in Arkansas.

Southwestern States operates in 26 Arkansas cities.

Grant Raise, EAS with Bell, Set Rate Hearing in Ill.

The Illinois Commerce Commission on Nov. 24 authorized LaHarpe Telephone Co. to increase telephone rates by $27,000 a year. The increase will give the company a return of 2.41 per cent on a valuation of $412,678.25 (TELEPHONY, July 22).

•

The commission also authorized Illinois Bell Telephone Co. to file schedules for extended area service from its Canton, Farmington and Fiatt exchanges to the Fairview exchange of Mid-Century Telephone Cooperative, Inc., Canton. No increase in rates is involved.

•

The ICC set for hearing on Dec. 13, the application of Mason City Telephone & Telegraph Co. to increase its rates at Mason City.

Wis. Commission Schedules Hearings on Rate Requests

The Wisconsin Public Service Commission on Nov. 28 was to have heard the petition of the Central State Telephone Co., Madison, for authority to increase its rates.

•

Scheduled for Nov. 30 hearing before the Wisconsin commission were the following petitions:

The request of Valders Telephone Co. to raise rates at Collins, St. Nazianz, and Valders on an interim basis; also the applications of Fennimore Telephone Co., Annaton-Preston Telephone Co., Montfort; Grant Telephone Co., and of Rewey & Mineral Point Telephone Co., Rewey, to raise rates.

Approve General of Nebraska Expansion Financing Request

The Nebraska Railway Commission on Nov. 20 approved an application of the General Telephone Co. of Nebraska, Columbus, for the issuance and sale of 34,000 shares of its common stock, par value $25 per share, to the General Telephone & Electronics Corp. at the price of $25 per share, or a total purchase price of $850,000.

In the same order, the commission gave the company authority to issue and sell 2 million dollars of its first mortgage 5 per cent Bonds, Series D, dated Nov. 1, and due on Nov. 1, 1991. The bonds will be sold to institutional investors at a price of 100 per cent of the principal plus accrued interest thereon from the date of the bonds to the date of delivery.

Together with $16,000 to be provided from company funds, the aggregate of $2,866,000 will be used to retire a $1,915,000 note payable to the General Telephone & Electronics Corp.; and

first mortgage 25-year bonds, 4¼ per cent, Series A, due Dec. 1, in the principal amount of $951,000.

The commission order noted that from Oct. 1, 1958 to July 31, 1961, the company had expended $3,549,420 in its construction program and that substantial and continuing expenditures will be necessary to meet service demands.

N.C. Company Seeks to Declare $110,000 Dividend

Oldtown Telephone Co., Inc., Winston-Salem, asked the North Carolina Utilities Commission on Nov. 20 for authority to declare a stock dividend totaling $110,000.

The company proposes to distribute one share of common stock at a par value of $100 to present holders of stock on the basis of one new share for each share now held.

Oldtown, in its petition, said it had a surplus of $171,239.86 for the year ended last June 30.

Plastic Rings on Ill. Bell Truck Handles Safety Device

In Chicago, Ill., Illinois Bell Telephone Co. has placed plastic rings around the door handles of its trucks, as a reminder to drivers that they should walk around the vehicle and look behind to make sure no children or pets are there, before driving away.

Motor equipment manager for Illinois Bell, Blaine Hoover, said this practice has saved the life of at least one small boy from injury under a company truck.

Approve Mo. Stock Transfer

The Missouri Public Service Commission on Oct. 27 approved the sale of the common stock holdings of O. C. Agne and Fred Meade in Lincoln Telephone Co. to Continental Telephone Co., St. Louis. Mr. Agne will continue as president of the Lincoln Company and Mr. Meade as vice president, and all other employes will continue in their present capacities, it is reported.

Ask Sale OK in Arkansas

The Dalark Telephone Co. on Nov. 9 asked the Arkansas Public Service Commission for permission to sell to the Allied Telephone Co., Little Rock. The Dalark company serves 23 subscribers.

Sounding Board

"His thoughts were slow, his words were few, and never formed to glisten; but he was a joy to all his friends—you should have heard him listen."—Gerald K. Young in the Blakesburg (Ia.) *Excelsior*.

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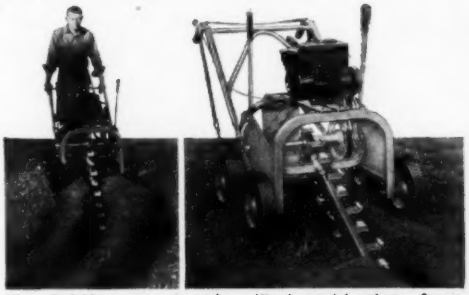

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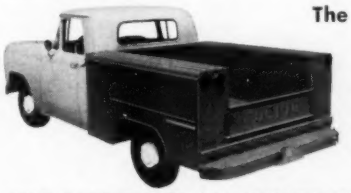

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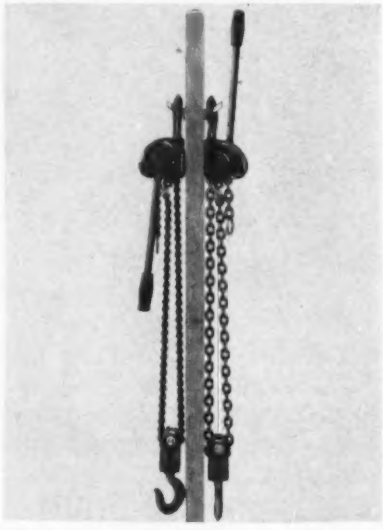
News on New Products

HAND HOIST—A 2-ton safety hand hoist is announced by Ratcliff Hoist Co. The company states this hoist will not free-chain under load, even if the control lever is tripped accidentally; nor will it free an interrupted load.

The housing is so designed that operator can rig the hoist flush with a wall, pole or other working surface.



Minimum distance between hooks is 15¾ inches, permitting use in limited headroom, the company points out. A removable lug hook holds the chain in double-chain position; an unhooking lug converts hoist to 1-ton capacity and doubles the speed of raising and lowering a load.

A single lever controls up, down or free-chaining. A 53-pound pull raises full load; a 5/32-inch raise or lower per stroke permits precise spotting, according to the Ratcliff company. The lever handle is 14 inches long, and operates in 12 different positions.

Housing and all load-carrying parts are made of shock-resistant steel. The hoist weighs 21 pounds. It can be stored in a 20x5x5-inch space. The hoist can be completely disassembled and reassembled in five minutes. Request NP 1762.

•

ELECTRICAL TAPE DISPENSER—A taping dispenser has been developed by Minnesota Mining & Mfg. Co. for the ¾-inch x 66 foot roll of "Scotch" brand electrical tape No. 33.

The single-use plastic dispenser is designed, 3M states, as a compact hand taping and cutting tool to speed on-the-job use of the plastic tape.

Advantages of the new dispenser listed by 3M are: Easy cutting of the

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12/2/61

tape; the cutter leaves a clean, square edge for a professional appearance; tape roll is exposed for thumb control of wrapping tension, and a convenient end tab of tape remains ready for each new use.

"Scotch" No. 33 in the dispenser pack is available, the company reports, at no extra cost through electrical distributors. The ¾-inch x 66 foot roll also continues to be available packed in the metal can. Request NP1763.

•

SUBSCRIBER CARRIER—The new Panhandle T-FM subscriber carrier is said to provide modernization of existing equipment through the following two methods:

(1) Tube-type units can be replaced with completely transistorized units.

(2) New completely transistorized systems can utilize spare units currently available for existing equipment.

The basic interchangeability of tube and transistorized units is made possible, Panhandle reports, by the incorporation of a new power unit—ac or dc standby in existing subscriber carrier systems.

According to the manufacturer, the new T (transistorized) FM equipment, and its interchangeability with existing tube units, offers simplicity of unit interchange. The application of new completely transistorized terminals, or the conversion tube type terminals and units to dc standby operation, are claimed to offer reliability, savings, and flexibility without expensive loss of existing equipment. Request NP1764.

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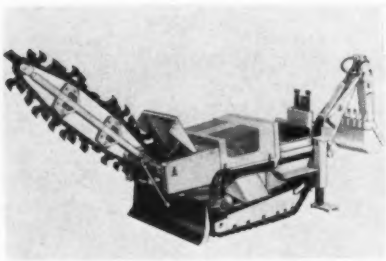
TRENCHER AND DOZER—The new Davis T-78 trencher and dozer with backhoe, an all-purpose excavating and leveling machine, has been introduced by Davis Mfg. Inc.



This machine is reported to be capable of handling every soil condition and every digging assignment from 3 inches to 36 inches wide to 8 feet 4 inches deep, and finishes up the job by backfilling and leveling to the final grade.

With this combination the user can handle normal trenching assignments up to 18 inches wide, then turn the unit around and employ the backhoe

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For telephone messenger wire or guy wire applications, you'll find CF&I Galvanized Steel Strand ideally suited for the task at hand. It is available in seven- or three-wire constructions in accordance with ASTM specification A-122. Or it can be tailor-made to meet your own specific requirements.

Available nationwide from a network of warehouses, Galvanized Steel Strand, like all CF&I products, is manufactured to meet highest American standards. For immediate delivery, contact your nearby CF&I sales office.

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LUBRICANT SPRAY

Lubricates, stops squeaks, protects. For use on Metal, Rubber, Vinyl. Wt. 13#.

16 OZ. BOMBS
PACKED 12 TO CASE
CODE SAP-3

MAGNA-SHEEN
PERFECT CONTROL
for
DUST PROBLEMS

Especially adaptable for areas where delicate instruments and switches are in use. Wt. 17#.

16 OZ. BOMB
PACKED 12 TO CASE

CODE SM-6

MAGNOLIA CHEMICAL CO., INC.
CHICAGO • LAFAYETTE, IND. • TAMPA • DALLAS
LOS ANGELES

Order from your Telephone Supply Distributor

to dig bellholes, laterals, connecting lines or use it to trench in rocky areas. The hydraulically controlled dozer, an integral part of the trencher, is said to backfill with a high degree of efficiency. It will level deep rutted areas to provide a smooth surface for more effective trenching.

The T-78 trenches, according to Davis, at speeds up to 840 feet per hour from 3 inches to 18 inches wide to 78 inches deep. It has an extra-large, 10 inch conveyor belt which can be set to deliver the spoil to either side of the ditch at the operator's option. An 18-hp Wisconsin engine drives the digging system and provides power to a hydraulic motor that activates a two-speed transmission. This not only provides a variable speed ditching control, but also gives the T-78 instant forward or reverse mobility in backfilling operations.

The backhoe attachment, the Davis D-100, operates off the T-78's hydraulic system, the company states. Pryout power is in excess of 10,000 pounds. It features a 180 degree continuous operating arc, and the boom swings at a constant speed because of a 2-in-1 swing cylinder which has a rack geared to a pinion in the mast. It has a lifting capacity of 1,000 pounds with the boom fully extended. The D-100 backhoe digs 8 feet 4 inches deep and has a full range of buckets from 12 inches to 36 inches wide. It is claimed to detach from the trencher in less than three minutes.

The design of the T-78 and the D-100 backhoe have been coordinated. Measuring 37 inches wide (with belt conveyor and dozer extensions removed) the machine is said to go through standard yard gates to get at work which larger units can't reach. It has ground-gripping traction, but also is balanced for high flotation with 3.6 psi ground pressure for the trencher and 5.1 psi ground pressure for the trencher and backhoe combination. This enables the unit to work on soft ground or in lawns with minimum damage to the sod. Rubber pads are available for the tracks if desired. Request NP1765.

•

PORTABLE HEATERS—Jet Burner Inc., announced the availability of its new portable fan and gravity heaters which can be used to provide temporary heat for manholes or other types of telephone construction work.

These heaters can be used either in an upright or horizontal position, shooting the heat either up or down. Or, they can be used with ductwork to direct the heat.

Two models are available. The model 275 gravity unit has an lpg input of 275,000 btu and manual controls.

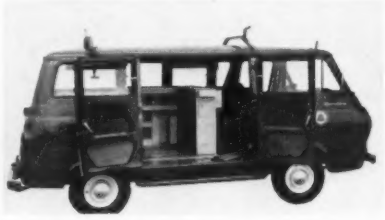
The fan unit, model 475, has an lpg input of 475,000 btu.

Other features of the 475 include:
Pressure type fan, 1,500 cfm.
115 volt, ¼ hp motor.
Flame failure safety controls.
Readily adaptable to use with ducts.

Both heaters are said to require no adjustments and do not cause smoke or fumes. They operate, Jet Burner states, on high or low pressure. Request NP1766.

•

INSTALLER INTERIORS—Utility Body Co. announces the availability of specifically designed interiors for installation in new compact van type trucks. These No. 0-331 installer interiors are designed, Utility Body states, to carry a complete assortment of tools, supplies and telephone sets necessary for the telephone installer to perform



his work efficiently. The assembly includes the various compartments required for storage of manuals, telephone books, instruments, materials and type PR payout reels.

The arrangement and compactness of these many items are said to convert any compact van type truck into an efficient installers unit. The No. 0-331 assembly also includes a double overhead ladder rack for carrying extension and step ladders. Request NP-1767.

•

INDUSTRIAL STAPLES—A new line of severe-service industrial staples has been announced by Heller Roberts Instruments Corp.

Made of steel base for strength, heavily electroplated with copper, the new staples are registered under the name "Heller-Ply". Heller Roberts declares them to be completely and permanently rust-proof, corrosion-proof

PLACING STRAND:

ONE OF MANY JOBS SKYWORKER HELPS TO DO IN HALF THE TIME!

SKYWORKER model 1025 — in use by leading telephone companies under the most rigorous operating conditions — is saving an average of 50% of the time required in almost all construction, maintenance and dismantling operations requiring men aloft. / Designed specifically for telephone line work in close liaison with well-known telephone engineers and management men, SKYWORKER model 1025 places men aloft quickly and moves them from one position to another efficiently — from one pole to the next in *seconds*. Fatigue is virtually eliminated and safety records climb. / SKYWORKER slashes man hours per labor unit cost on these jobs aloft: placing strand, cable, multiple wire, cable blocks and guys; re-lashing and re-ringing cable; re-tensioning strand; cable patrol and repair; removing cable, strand and crossarms. / SKYWORKER now offers, as optional equipment for the model 1025, the very best fibre glass boom obtainable: a boom that provides exceptionally high dielectric strength for the protection of *crewmen aloft and on the ground*. / Write or phone today for a complete SKYWORKER model 1025 file including literature, specifications, film and purchase plans.

model 1025

HUGHES-KEENAN DIVISION *U.S. Air Conditioning Corp.* P.O. Box 360 Delaware, Ohio Telephone 363-1231

NUMBER 17 - *Toll Grade. Has about the longest leakage path possible with a single petticoat. For exchange circuits and lines not exceeding ten miles.*

HEMINGRAY INSULATORS

Easily and Economically Installed

Hemingray Glass Insulators stand up under severe conditions, do not deteriorate, provide the service you need to assure continuous operation of communication lines. The dependability of Hemingray Insulators as proved by their years of sturdy performance is one of the reasons behind their world-wide acceptance.

Hemingray has pioneered many insulator developments to keep pace with requirements, improve communication systems, assure you a dependable source of supply.

The immediate availability of these insulators is further assurance of Hemingray dependability. An up to date distribution system makes Hemingray Insulators available when you want them and where you need them.

Hemingray Glass Insulators are a product of Kimble Glass Company, subsidiary of Owens-Illinois, Toledo 1, Ohio.

There's a Hemingray Insulator to meet every communication line requirement.

World standard for quality Since 1870

HEMINGRAY INSULATORS
AN (O) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

and salt-water-proof; and that they will not stain or "run" on the materials they hold.

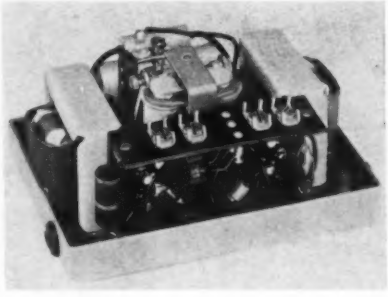
The announcement goes on to state "these new staples withstand severest conditions.

"For telephone, electronic and electrical equipment manufacture, installation and repair, they combine rust-corrosion-salt-water immunity with low cost for such uses as fastening drop wires, floor-joist runs, baseboard runs . . . any outdoor or indoor point where low-voltage wiring must be fastened."

The new staples are made in a wide variety of crowns, points and sizes and can be used with Heller tackers and staplers of any type or vintage. Request NP1768.

•

RINGING RELAY—The United States Instrument Corp. has announced the development and patenting of a multi-frequency ringing relay, which is said to have unlimited applications to both telephone and other industrial requirements.



By way of explanation, U. S. Instrument says that during its development, application of the relay was directed toward improving heavily loaded line ringing. Use of this relay, says the manufacturer, allows multiple signalling devices (loud-ringing bells, klaxons, chimes, etc.), even on already overburdened subscriber lines, without commensurate power draw.

Also, design variation of this unit, operating in the higher frequency ranges, can be, and is being, applied in the design and manufacture of dual function and other trunks.

The frequency sensitivity of this relay is described as superior. Further,

it is unresponsive to side frequencies or transient voltages. Bandwidth is 4 cycles at ringing frequencies.

This relay is designed for manufacture in all established levels of the decimonic, harmonic and synchromonic frequency ranges and extends frequency possibilities into the 200-cycle range. It is, of course, a high impedance device, USI points out.

The entire relay with cover occupies 2¼ x 3¼ x 4¼ inches. Request NP1769.

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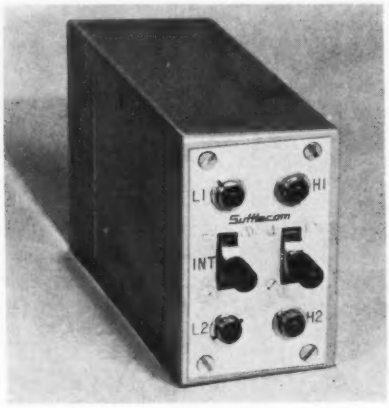
SWITCHING SYSTEMS—Announced by Suttle Equipment Corp. is a new series of three lighted switching keys, providing full trunking and intercom service in a completely flexible communications package.



Suttlecom communications systems utilize the new SE-6080A single three-way switching key, with two trunk key positions, intercom talking path key position, and trunk busy visuals. The SE-7080A double three-way switching key (see cut) includes the above, and adds two key positions for trunk holds as well as busy visual lamps on the two hold positions.

Standard industry Suttle-manufactured push-buttons, buzzers, 3-inch ringers, retard coil, and connecting blocks, plastic mounting backboards and covers—all in blue beige color—are used in the Suttlecom trunking and intercom switching system. No relays are needed or used.

Installation is made by using industry standard 11-pair, 22 gauge plastic cable with conductor color coding and numbered terminal assignments—the cable also available from Suttle. Request NP1770.

•

POWER SUPPLY LINES—Suttle Equipment Corp. also has announced its SE-100X series of power supplies for key-system, auxiliary power service, and many other telephone equipment uses. Regulation of these units

The Outdoor Telephone Canopy (GP-2500, List 1) is a revenue builder in the daytime or at night. And it's constructed to last for years.

The large, easy-to-read lettering is silk screened in red or blue on the white canopy. The lettering stays bright and colorful for years. Unless specified differently, red will be shipped.

At night the unit and surrounding area are lighted by 32 watts of fluorescent lighting. If in an area where bugs are easily attracted, the canopy can be treated to provide a yellow light invisible to most bugs.

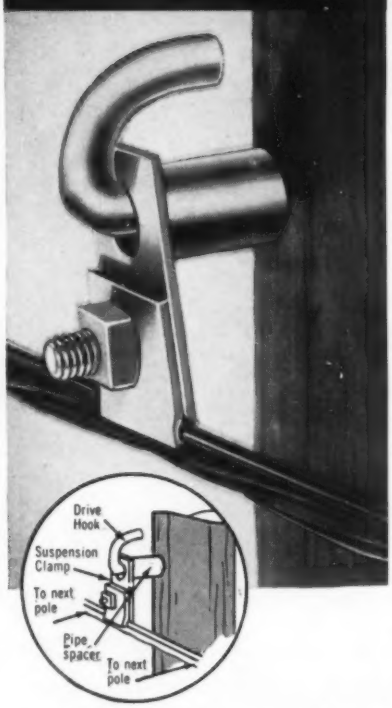
The large canopy protects the caller from the sun, yet there is complete air circulation. The clear plastic sides provide adequate protection in slightly bad weather. Also, these clear plastic sides discourage tampering with the telephone.

The Outdoor Telephone Canopy can be pole, wall, or pedestal mounted. When pedestal mounted, the total height of the unit above ground is 88". The dimensions of the unit are 56¼" high, 30¼" wide, and 39" deep. *The GP-2500, List 1 is shipped complete with pedestal, ready to install.*

Gladwin manufactures many products for the telephone industry. Included are Shelf-Ettes®, Boothettes®, a variety of lighted and non lighted signs, and display stands. Write for a free catalog today.

GLADWIN PLASTICS, INC.
165 COURTLAND ST., N. E.
ATLANTA 3, GEORGIA - 525-5384
Area Code 404

SUPERIOR TANGENT SUPPORTS



Superior Tangent Supports TS 222 and TS 934, constructed of galvanized steel, provide a low-cost, simple method of supporting I.M. (Integrated Messenger) wire products. TS 222 will support a steel messenger of .062 diameter. TS 934 will accommodate steel messengers of .083, .109 and .134 diameters. Both tangent supports hang on the 7/16" diameter drive hook.

For prices, write

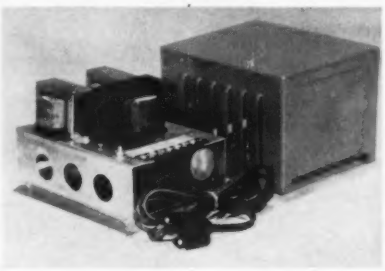
SUPERIOR CABLE

SUPERIOR CABLE CORPORATION
5581 HICKORY, NORTH CAROLINA

is an optimum ± 5 percent and the dc ripple is 5 mv.

The units take advantage of modern electronic circuitry and components such as Zener diodes, electrolytic capacitors and new type fuses, Suttle states.

Size is 5 x 7 x 6 inches. All models are fully fused, and weigh only 8 to 9 pounds each. Key slots are provided for wall mounting.



Included in the line of five different models is the SE-100X (shown here with case off), providing 6V., 12V., and 24V., ac power at 2.0 amps., and 48V., dc signal and talk power at .25 amp. The SE-150X provides the same as the SE-100X, but dc talk and signal output is at .5 amp.

The SE-200X is a 48V., dc only, signal and talk unit with .25 amp. output, and the SE-250X is the same, but with .5 amp. output.

An additional model is the SE-300X, a 48V., dc signal or talk power source, which supplies 30 volt dc power at .5 amp. Request NP1771.

PROTECTION

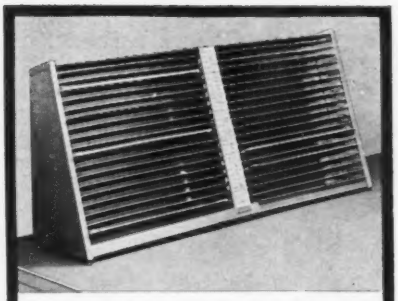
Continued from page 54

example, to go under a railroad) there must be protectors at both ends of the dip. Otherwise a heavy charge coming in on the open wire from either direction would most certainly break through to ground in the underground dip and cause cable trouble.

High-Tension Lines

A cross with a high tension power circuit is even worse than a stroke of lightning. The voltage is somewhat comparable to that of lightning, but the frequency is only 60 cycles (sometimes 25 cycles). Therefore, unlike lightning, it is not deterred by a small inductance and will, therefore, travel a long distance in a cable. It readily jumps small air gaps and may, therefore, appear at some far distant part of the telephone plant to cause damage or death. Fortunately, if construction specifications are followed, there is little or no danger of accidental contact with this very dangerous voltage.

Telephone companies never have joint construction with high tension



Trouble Recorder Card Rack

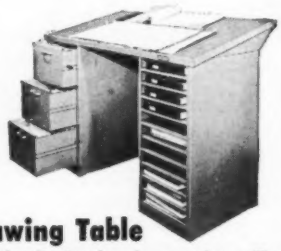
For fast orderly sorting of Trouble Recorder cards, has 38 card slots in two banks with index strip between. Base is 38" by 8". Height 15". No. D-30325-1.

Telephone Office Equipment

to lighten your work and improve efficiency

Work Bench

For repair, assembly, test and paper work. Top drawer divided into 24 compartments for parts and tools. Large file drawers are for circuit drawings. 54" x 25" top covered with masonite. Height 36". Drawers may be inserted from back to reverse position of kneehole. No. D29978-3.



Drawing Table

For circuit drawing in crossbar offices, provides central location for reference material. Masonite top is 30" x 60". Height 36" at front, 42" at rear. Three large file drawers at left for drawings. Eleven shelves at right are 2½" high, 14" wide, 18" deep for sketches, sequence charts, book type SD sheets, trunk serials, etc. No. D30326-1.

Color of all units: Baked-on gray enamel unless otherwise specified.

TWIN POST
Neubauer
MANUFACTURING CO.
517 LOWRY AVENUE N.E.
MINNEAPOLIS 18, MINN.

circuits. And they very rarely parallel such circuits on the opposite side of the road. Paralleling the high tension circuit at such a short distance can produce dangerous voltages and currents on the telephone circuits by induction. Also, it would be very difficult to avoid noise interference. The power companies are very cooperative in this matter and most of their high tension leads are built on private right-of-way.

At crossings a metallic net is placed under the high tension wires. This net is grounded and is so positioned that if a high tension wire breaks, the ends will fall on the net. This will operate the power company circuit breakers in about one-fourth of a second. We understand that the power company always shares in the cost of such a crossing. If it is necessary for one or more drop wires to pass under a high tension lead, the best method is to use an underground dip.

Seek Advice If Necessary

The power company usually has one or more telephone circuits of its own bracketed below the power wires. These are private lines and the power company assumes the risk. However, there may be cases in which the telephone company would be involved. The power company may wish to connect one of these private lines to a PBX board, which is owned by the telephone company, or to their own PBX board, which has trunks to the telephone company central office. It may be readily seen that, in this case, there is great danger of high tension voltages finding a way into telephone company plant.

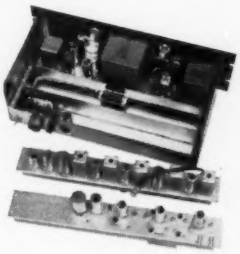
This is a very special case and a small company will do well to consult the protection engineering department of some large company before proceeding with such an installation. The protective equipment required is very elaborate and somewhat bulky. It is usually furnished and installed by the power company according to the telephone company specifications.

Installing a telephone in a transformer station where high tension voltage is reduced to primary voltage is a very special case. If the telephone company does not have specifications covering this case they should consult some larger company.

Installing a telephone in a broadcasting station is another special case. These stations use very high voltages and there is also the danger that a large amount of the broadcast energy will be picked up by the telephone wires. A small company should thoroughly study the latest practices on this subject before proceeding.

In the days when insulation, rather

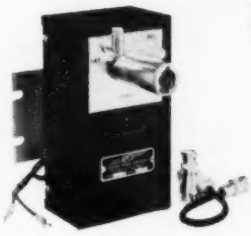
ERCO QUALITY RADIO COMMUNICATIONS EQUIPMENT



UNIVERSAL TYPE CERTIFIED COMMUNICATIONS RECEIVER

This "type-certified" unit features two rapid plug-in RF converter strips for operation in frequency range 108 to 152 mc or in UHF 225 to 400 mc. Excellent for ground-to-air communications.

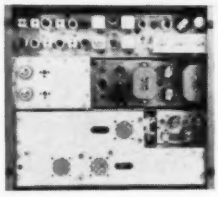
WRITE FOR TECHNICAL BULLETIN NO. 516-RV-RU



SELF-POWERED PREAMPLIFIER FOR UHF RECEIVERS

For use where additional sensitivity is required. Designed for use with Erco's 362-R UHF Receiver and others. Easy to install. Has overall gain of 12 decibels minimum and net gain of 8 decibels minimum. Dimensions 6½" x 3¾" x 4½".

WRITE FOR TECHNICAL BULLETIN NO. 362-RPA



UHF TRANSMITTER-RECEIVER

Operates from standard AC power mains as a fixed low power radiotelephone for communicating with aircraft. Frequency range 225 to 400 mc with highly efficient transistorized power unit for both transmitting and receiving.

WRITE FOR TECHNICAL BULLETIN NO. 425-TRA

UHF TRANSMITTER FOR GROUND-TO-AIR COMMUNICATION

Designed for 225 to 400 mc range with sufficient panel space to accommodate UHF Receiver so as to form complete packaged station. Antenna switching relay is included so that one antenna may be used for transmitting and receiving. Transmitter carrier on-off functions are controlled by the microphone push-to-talk button. Remote control console for operating transmitter over telephone line up to 20 mile distance is available.

WRITE FOR TECHNICAL BULLETIN NO. 361-TB

ERCO RADIO LABORATORIES, INC.
GARDEN CITY, NEW YORK
PIONEERS IN RADIO COMMUNICATIONS • SYSTEMS • QUALITY EQUIPMENT

New techniques in COMMUNICATIONS

Gustav Hirsch Organization, Inc., offers the most comprehensive program in the communications industry — skilled engineering, quality construction and many special services.

GHO projects include toll dialing, microwave circuiting and automatic switching. For expansion or an entirely new system, GHO is ready to serve you.

than bonding and grounding, was relied upon for protection, many insulated cable splices were made. If any such splices are required at the present time it is a very special case. Therefore, any unnecessary insulated splices should be strapped out.

We will not discuss central office line protection at this time as this will be the subject of another article.

Finally, there is the old adage, "circumstances alter cases." If a company has followed a good protection practice to the letter and still has excessive lightning or power cross trouble, additional protection may be required. They should consult a competent protection engineer.

TRANSMISSION SYSTEMS

Continued from page 28

network operations may at times require a return path over another one-way transmission system.

The components of an AM or FM carrier transmission system to supply the one-way channels that form the links in the over-all customer-to-customer telephone channels is indicated in *Fig. 5*. The incoming signals are the voice frequency message signals from the four-wire terminating set shown in *Fig. 2*. The carrier terminals limit the frequency band and signal amplitude and translate the voice frequencies through one or more steps of modulation to the desired frequency in the broadband channel. The carrier terminals typically include modulators, demodulators, amplifiers, pads, and filters. Signal-to-noise penalties, objectionable modulation products, carrier frequency stability, and stability of gains and losses versus time, are important factors in such terminals. From these terminals, the broadband channel may then be transmitted directly on to a wire line as in amplitude modulated wire systems or it may frequency-modulate a microwave carrier for transmission on a radio system. The broadband signal is then transmitted through many more or less identical repeater sections composed of wire or radio media with their losses and compensating repeaters. After the signals have passed through a number of repeater sections, a more complicated repeater is sometimes required in which the signal can be equalized, i.e., in which accumulated deviations from the desired transmission characteristics can be compensated for by adjusting networks. Finally, a point is reached where at least some of the circuits are to be dropped. At this point, the signals must be demodulated back to the voice frequency, making use first of an FM terminal, if it is a radio system, and in all cases by means of appropriate carrier terminals.

If a television channel is being transmitted on an AM carrier system, the carrier terminal translates the video signal to the desired place in the spectrum, and then basically the same microwave or coaxial high frequency repeatered line may be used, except that now delay equalizers must also be provided to correct accumulated delay distortion due to line, repeaters and terminals.

Just as the need to transmit TV programs established new requirements, so the expected growth of data transmission as well as other projected new types of service will place new demands on the plant in terms of the signals it must be capable of switching and transmitting.

Impact of Links and Section Multiplicity

In the preceding text, it may be seen that customer-to-customer communications channels can involve a multiplicity of different links connected together in various ways. We may also note that local plant is basic to every connection; its efficiency and uniformity, with respect to loss, noise, and impedance—to mention but a few of the factors that must be considered —affect the entire system. It has also been indicated that the longer transmission systems used to interconnect central and toll offices, link by link,

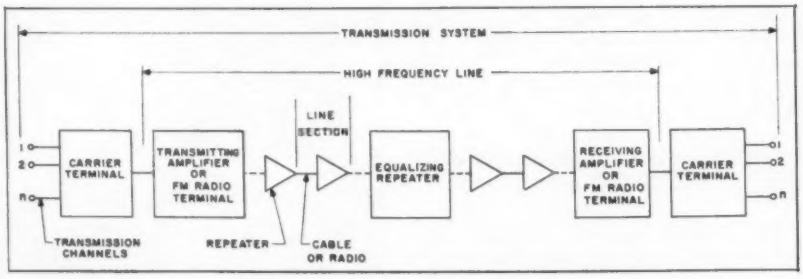
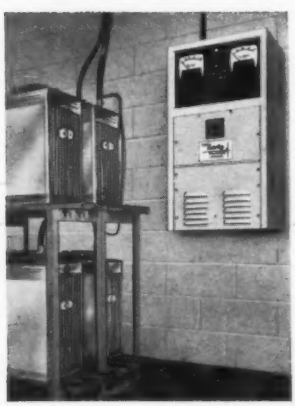


Fig. 5. One-way transmission system.

Microwave users

GET "RELIABILITY"

use C&D PlastiCal® or PlastiCell batteries—*
combined with a C&D AutoReg® Silicon Power Supply



To be sure of continuous, never-failing power for microwave systems, power them with a combination of a C & D battery and an *AutoReg* Silicon Power Supply.

C & D batteries are available in two types: premium PlastiCal and standard PlastiCell. Both have extra thick *triple insulated* positive plates and come in compact, lightweight, space-saving plastic containers equipped with safety vents.

C & D's *AutoReg* Power Supply matches the C & D batteries designed for communication service. It features a silicon diode rectifier that never requires aging adjustments. Charging rate is dictated by the battery and the combination is virtually maintenance free.

Specify C & D, and choose the standby power package best suited to your equipment.

PlastiCell—37 sizes with 14-year life, lead antimony plates, covering 10 to 1680 A.H.

PlastiCal—27 sizes with 25-year life, lead-calcium plates, covering 10 to 1680 A.H.

AutoReg Silicon Power Supplies—Wide variety of models to cover all 24, 48, and 130 volt applications.

For complete details and specifications write for Bulletins T-532 (PlastiCal) and T-533 (PlastiCell) plus Bulletin AR-108.

C&D

C & D BATTERIES
of Conshohocken, Pa.
DIV. THE ELECTRIC AUTOLITE CO.

Manufacturers of *Slyver-Clad* ® Industrial Batteries • PLASTICELL * and PLASTICAL ® Batteries for Communications, Control, and Auxiliary Power • Producers of *AutoReg* ® Silicon Chargers and *AutoCal* * Charger-Battery Combinations.

*Trademark

will often include terminals and sections of line which, in turn, are composed of numerous more or less identical repeater sections.

This composition of the over-all channel gives rise to two problems that have a major bearing on everything that is done in connection with transmission systems.

In the first place, the accumulation of performance imperfections from a large number of links and sections leads to severe requirements on individual units and to great concern with the mechanisms causing imperfections and the ways in which imperfections accumulate.

In the second place, the variable complement of links forming over-all channels makes the problem of allocating tolerable imperfections among the links on an economical basis most complex. Deriving objectives for a channel of fixed length and composition is a problem in customer reactions and economics. However, when the channel objectives must be met for widely varying lengths of channels and composition of links, the problem of deriving objectives becomes an even more complex statistical study involving considerable knowledge of the plant layout, operating procedures and the performance of other systems. We will have more on this subject later in this series.

(To be Continued)

Bell Vice President Heads N.Y. Nuclear Recovery Group

Benjamin H. Oliver Jr., vice president for Upstate New York of the New York (Bell) Telephone Co., on Nov. 12 was chosen by Gov. Nelson Rockefeller to head a special committee that will prepare plans for getting New York back to its feet after a nuclear attack.

This committee, the governor said, would "develop plans and specific programs for the vital recovery and rehabilitation of our state."

Governor Rockefeller said Mr. Oliver would take a leave of absence from New York Bell to serve without salary as chairman of the committee.

IN THE NATION'S CAPITAL

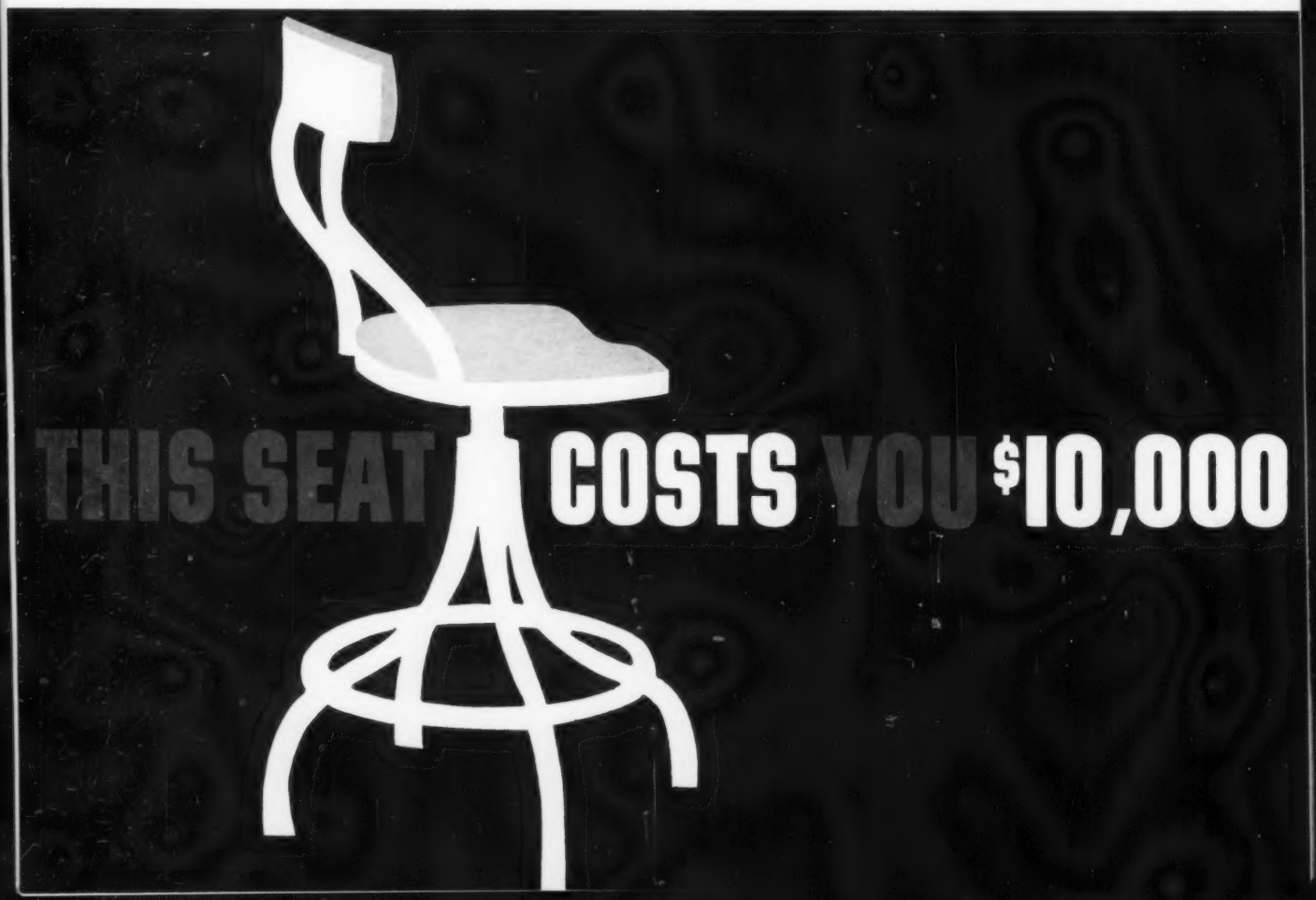
Continued from page 18

for some special unit to look after the welfare of consumers and the White House has since commented that such a plan is regarded as "an absolute political commitment."

Sen. Estes Kefauver (D., Tenn.) a man who always tries to espouse causes which have potentially great voter appeal, has suggested a "Department of Consumers" with cabinet status. The consumer "lobby" could find a haven in the Department of Urban Affairs proposed by the administration which will undoubtedly be again pushed during the next session of Congress (irrespective of the pious intentions to curb government expansion and hold the line on government hiring). The House and Senate Committees on Government Operations approved a bill creating such a department last session.

Katie Louchheim, a faithful Democratic Party worker for many years, was rewarded for her efforts by being appointed a consultant on women's activities for the State Department. It is generally expected that if any such agency to represent consumers is created, Mrs. Louchheim will play an important role in it.

The establishment of such an agency could have serious ramifications for the telephone industry because you may be sure that giving official status to a consumer group would result in a new,



loud federal voice at all rate case hearings.

George L. Clements, president of the Jewel Tea Co. grocery chain, told a Newspaper Food Editors Conference a few months ago he felt that a federal Office of Consumer Counsel might work against the interests of consumers rather than for them. "Experience indicates that professional spokesmen invariably attempt to make a judgment as to what is good for the consumer, thus interfering with the freedom of choice and the freedom to compete." As an example, he cited a case in California where a state consumer counsel attempted to make sure packages of frozen peas carried the precise weight shown on the package. Slight weight variations resulted from high-speed packing machines, he said, but the packing operation helped to reduce costs. If the state had enforced the precise weight requirements he said, "it would have added to the prices paid by the consumers for frozen peas."

The establishment of a Department of Urban Affairs will be strongly opposed by Republicans and conservative Democrats. There is also some interdepartmental power jealousy involved. The Agriculture Department is trying to stake out a preserve for REA in the area of "rural industrialization," and the Interior Department and the General Services Administration have activities of their own to protect.

That's just what this country needs: a new federal agency. If the big-government boys get their Department of Urban Affairs, you may be sure that someone will advance a proposal for a Department of Suburban Affairs.

SOUTH CAROLINA CONVENTION

Continued from page 69

present TV activity grew out of two years' experiment in a Columbia high school.

With a 50 per cent increase in high school enrollment, anticipated within the next five years; and with low sal-

When Frank G. La Prade (center) of Martinsville, Va., president of United States Independent Telephone Association, appeared before South Carolina Independents recently, these leaders in telephony posed with him. At left, Lewis B. Thompson of Abbeville, and Frank S. Barnes Jr. of Rock Hill. At right: J. D. Garrett Jr. of Lewisville, Ark., secretary-treasurer of the Arkansas Telephone Association; and G. W. Weathers of Bowman, S. C.

ANNUALLY!

A Toll Position costs you approximately $1,250 per year! Operator wages to man that position can run to another $8,750 annually!

NORTH ELECTRIC
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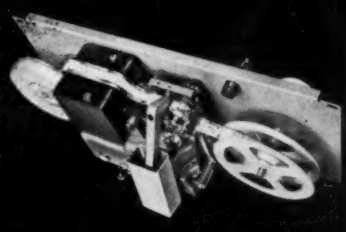
enables each existing operator to handle ⅓ more toll calls. Present traffic can be handled at a proportionately lower cost or you can meet the demands of increased traffic without enlarging your operator force.



Your North Electric representative can show you how much more PREMIUM AuTollizer can do and save for you!

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TELEPHONE LOADING COIL ASSEMBLIES AND ACCESSORIES

CEECO

★ Steel case assemblies available for manhole mounting and direct earth burial.

TYPE C124 LEAD CASES

Equipped with Types 632 (88MH), 638 (44MH), 642 (88MH) or 641 (44MH) coils. Contain 4 to 76 coils—lead or plastic stubs.

TYPE C125 STEEL CASES

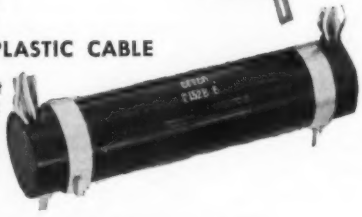
Equipped with Types 632 (22MH), 638 (44MH), 642 (88MH) or 641 (44MH) coils.

SPLICE MOUNTING ASSEMBLIES

TYPE 167 CASE FOR LEAD CABLE
TYPE 162 CASE FOR PLASTIC CABLE
Using one to sixteen Type 632 (88MH), 638 (44MH), 642 (88MH) or 641 (44MH) coils.

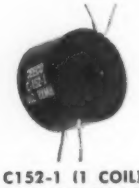
TYPE C152 CASE FOR PLASTIC CABLE

Sizes—One to twenty-eight coils. Using Types C652 (88 MH) or 651 (44MH) coils.



READY MOUNT LOADING COIL CASES FOR SPLICING CASES AND BURIED CABLE TERMINALS

C152-3 (3 COILS)



C152-1 (1 COIL) "BOLT MOUNTING"

TYPE C152 CASES

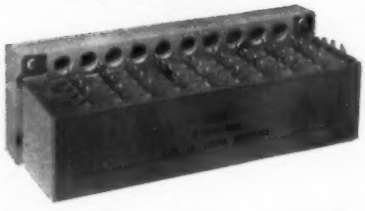
Are equipped with one to 26 type 652 (88MH) 651 (44MH) or 656 (66MH) coils. For mounting in splice-maker cases and terminals.

C-100 TEST SET

C-100 Test Set for making acceptance tests and locating loading irregularities.

Economical
Easy To Use
Reliable
Guaranteed Results

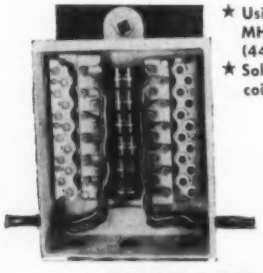
C600A1 CASE



C600A1 Case equipped with 10-C1574A Inductor capacitors or loading coils for mounting on horizontal side of MDF.

TYPE 177 TERMINALS

FOR 6, 11, 12, 16 and 18 PAIR RURAL DISTRIBUTION WIRE



★ Using Type 637A (88 MH) or Type 637B (44MH) coils.
★ Sold with or without coils.

TYPE 637A COIL

NONPROTECTED READY MOUNT ASSEMBLIES

(FOR ALL STANDARD PARKWAY TERMINALS)

16 PAIR No. CP16-137

12 PAIR No. CP16-136

6 PAIR No. CP16-135

2 PAIR No. CP16-134

ONE PAIR No. CP16-133

CAPACITORS TYPE C-1574-1 INDUCTOR

CEECO LOADING COILS ARE SOLD BY YOUR TELEPHONE EQUIPMENT SUPPLIER

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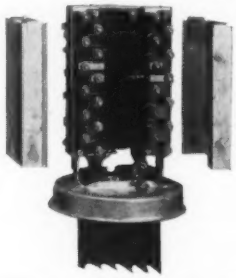
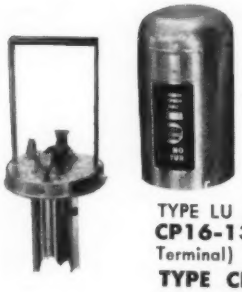
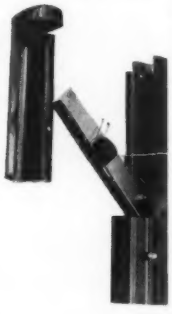
PEDESTAL TERMINALS



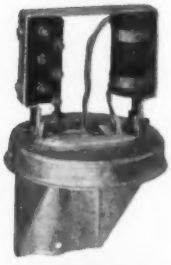
TYPE LUG (Shown With C637A Coils) Complete With Terminal Strips and Protection Side Plates
TYPE LAG—With Bracket For Pole Mounting



TYPE LU (Shown With **CP16-135,** 6 Pair Terminal)
TYPE CBD Same Construction Only Galvanized



TYPE LU-1 Wire Terminal



LA-3 Pole Terminal With CP16-135 Six Pair Ready Mount Terminal Assembly and One C-152-3 Loading Coil

P16-147
Pedestal Gasket (Sold Separately)

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ary scales for teachers giving little hope of attracting the 5,000 additional teachers required, it was decided, after comprehensive studies, to try teaching by television. The experiment proved that TV instruction was academically effective and financially feasible.

Mr. Kalmbach reported that the nation's first breakthrough in costs for transmission facilities resulted from planning conferences with the Southern Bell and the Independents. With an initial legislative appropriation of $643,000,000, an educational TV center in Columbia was built, equipped, staffed with teachers and technicians, and the first three legs of the statewide network were completed.

At the present time, 69 schools out of 413 high schools are served by the system. It is hoped that further expansion of the system will provide an ultimate of six channels to all schools in the state. The operating telephone companies will provide the necessary network of microwave and coaxial cable channels.

Harold Clark, area director for REA in his convention address, stated that it has been 11 years since the first REA loan was made to a telephone company in South Carolina. Today, REA telephone borrowers in South Carolina number 15 out of 45 Independents listed in TELEPHONY's 1960 Directory of the Telephone Industry. More than a third of the farms in this state now have telephones, and a growing amount of the service is modern dial.

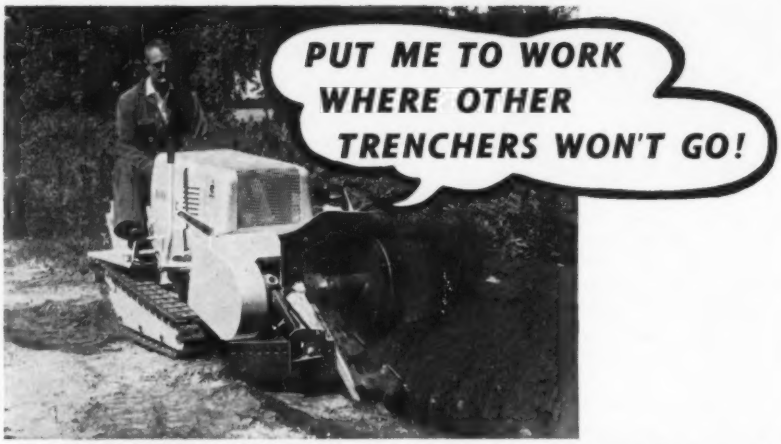
"Of course," said Mr. Clark, "there was a lot of catching up to do in South Carolina—as in other states, too. A decade or two ago, telephone plant was obsolete, and service expectations were pretty bleak in many rural communities. Most of you can remember what it was like. Small Independent companies and farm-owned mutuals found themselves unable to finance new plant to reach additional areas, or to raise the quality of telephone communication for existing subscribers. The big companies at that time were preoccupied with catching up on the backlog of orders after the lean war years.

"Here in South Carolina we have completed a study of census data which demonstrates the proportions of the area coverage job still untouched. The tabulation reveals that in each of 22 counties in South Carolina, there are from 500 to 1,000 farms without telephones of any sort. In each of 11 additional counties, there are from 1,000 to 2,000 farms without service. And in 5 more counties there are more than 2,000 farms without telephones. Granted that some considerable number of these farms cannot presently afford telephones, they are balanced out by many non-farm homes, stores, and other establishments in these same counties which could afford telephones—if the service were available.

"Here is a market potential for telephone service in the state that is not being developed," Mr. Clark reminded his audience. "Here are the people REA is talking about when we point to our area coverage goal. Who will provide telephones in these unserved areas? The telephone industry competes with others for the consumer's dollar. You offer a service that is essential to our American standard of living, but for those families who are not familiar with its benefits, educational sales promotion will have to be stepped up."

A special Bell transmission system program was presented to the con-

One of the largest CDO's in the country—serving 6,000 stations—is the Charleston, Ill. exchange of Illinois Consolidated Telephone Co., Mattoon. The well-designed building above is of reinforced concrete construction and houses a commercial office as well as equipment. The one-story building has a basement and is air conditioned.



DAVIS T-66 *has positive traction and maximum flotation...* Ground-gripping positive traction with no rubber-tire bounce ... high flotation — only 3.6 psi ... ability to cross trenches ... and compact design with only 37" width put the Davis T-66 on jobs where other trenchers can't operate. All of these features, plus the T-66's high digging performance make it a real money maker for trenches from 16" wide, 24" deep to 4" wide, 66" deep. It will even dig flush alongside walls, fences, etc. It gives added versatility with its own backfill blade, horizontal earth borer and numerous other attachments. It's the most maneuverable trencher in the field with each track independently driven and with Instant Forward/Reverse. Operates with horsepower — not manpower! Take a look for yourself and compare. Write for descriptive literature...

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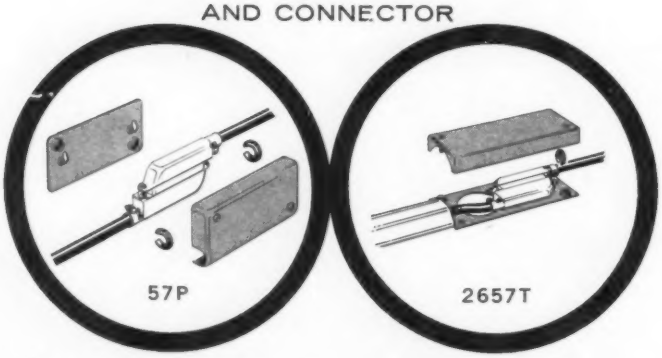
TWO NEW FITTINGS
TO HOUSE PLUG AND CONNECTOR



For use with plug-ended multi-button telephone sets, these two new Wiremold Service Fittings are available in blue-beige, smooth enamel finish (57P), and non-glare, light gray finish (2657T). Use 57P for wall mounting; use 2657T for floor mounting with overfloor duct (1500 or 2600 Wiremold) or with underfloor duct, and for wall mounting with 4" box. Phone for data sheet 636.

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vention by Messrs. W. C. Farrell of the AT&T Co. of New York City, and L. R. Montfort, of the Bell Telephone Laboratories, Murray Hill, N. J. This program demonstrated a new method of checking subscriber's loops designed by the resistance method. A slow sweep-frequency oscillator with a shaped output is connected to the loop in the central office. A simple portable meter is used by repairmen in the field to check the loop from the subscribers' premises. It is then a simple matter to interpret the measurements to determine whether or not we have a good loop. The proper design of subscribers' loops is most important, as two of them are involved in each toll connection.

The transmission and communication improvement committee of the South Carolina association, and the Southern Bell Telephone & Telegraph Co. have prepared a bulletin on subscriber's loop design. This bulletin describes a rule-of-thumb method of loop design which should prove useful until a better method comes along.

Elected as South Carolina association directors for 1961-64 are: H. W. Askins of Chesnee; F. S. Barnes Jr. of Rock Hill; A. O. Bolen, Swansea; S. S. Helmly of Monck's Corner; C. B. Barksdale Jr. of Greenwood; Charles Bell of Chester; E. W. Hart of Hemingway; T. Carter Thomasson of Lancaster; R. D. Coker of Simpsonville; George Thompson of Southern Pines, N.C.; Lewis Thompson of Abbeville, Joe Winn of Sumter.

Also elected were: R. E. Seymour of Greenwood; and John M. Barnes of Rock Hill.

The directors elected these officers: President, Mr. Helmly; vice president, Mr. Barksdale; treasurer, Mr. Seymour; and secretary, Mr. Barnes.

SW Bell Names Petty, Moskop PR Vice Presidents

C. Woodrow Petty and Roy L. Moskop were appointed assistant vice presidents in the public relations department of Southwestern Bell Telephone Co., St. Louis, effective Dec. 1, according to Justin E. Hoy, vice president-public relations.

Mr. Petty, formerly general customer relations manager at St. Louis, joined the company in 1940.

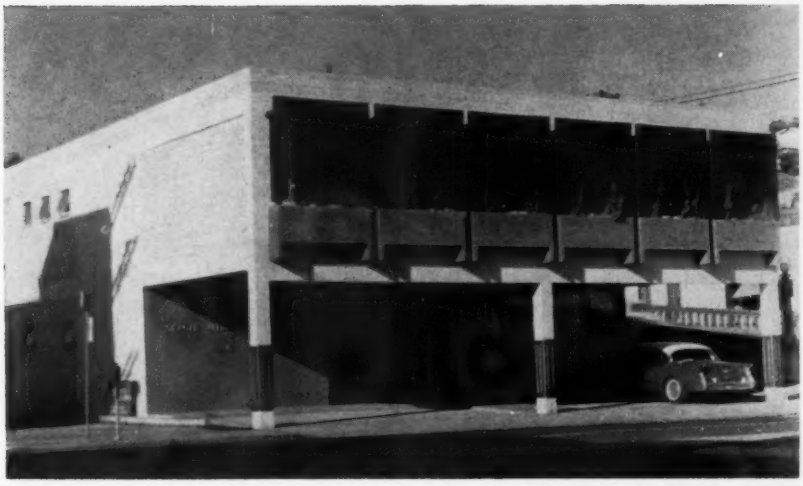
He was appointed public relations manager for the Missouri-Illinois Area in 1952; was promoted to general advertising manager two years later.

He transferred to Houston, Tex., in 1956 and returned to St. Louis in 1959.

Mr. Petty is a 1934 graduate of Arkansas Tech.

Mr. Moskop joined Southwestern Bell at St. Louis in 1947.

He was appointed public relations



New general office building of the Skagit Valley Telephone Co. in Mt. Vernon, Wash. More than 1,000 subscribers visited the offices during a recent open house and inspected new ITT Kellogg central office equipment additions. Ten of the company's 11 exchanges are dial operated. In the last 11 years the company gained 4,000 stations—from 4,800 to 8,800. The company was one of the first (in 1948) smaller Independents to adopt computers to prepare subscribers' bills. In photo at right is G. J. Stover (left) president and R. A. Ringman, general manager, of the Skagit Valley Company.

manager for the company in Arkansas in 1950 and returned to a similar job at St. Louis two years later.

He became general information manager in 1959.

Mr. Moskop was graduated from the University of Missouri in 1942.

MST&T Names P. R., Idaho Vice Presidents

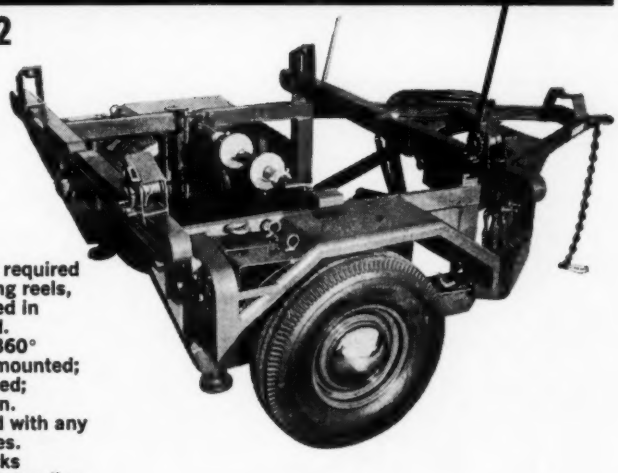
Robert V. Morris has been elected vice president, public relations, for Mountain States Telephone & Telegraph Co. He was formerly Idaho vice president and general manager at Boise. Mr. Morris joined Mountain States in 1940.

He will be succeeded in his position at Boise by Robert K. Timothy. Mr. Timothy had been Colorado commercial manager at Denver.

POLE AND STRAND DOLLY

HOGG & DAVIS MODEL H40BOT2

Built to meet the requirements of any utility engaged in Strand or Cable Reel transporting, and pole and material hauling, this unit, with **hydraulic lift,** makes it possible for one man to load or unload maximum sized reels.



FEATURES:

- ★ 4000 lbs. capacity
- ★ Reel capacity 20" to 50" dia., 44" wide
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- ★ Full hydraulic lifts
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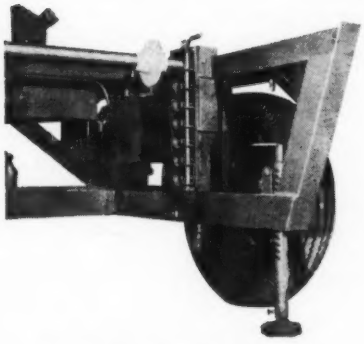
- ★ Self-locking bolster chocks with cable for each bolster



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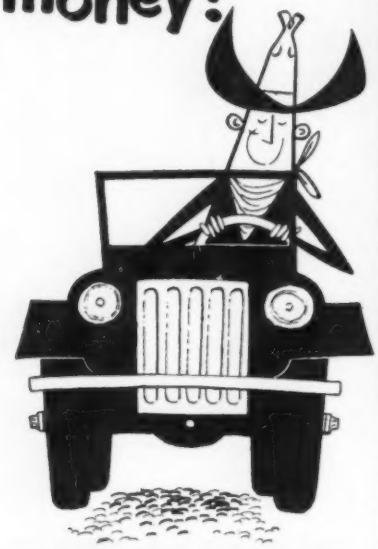

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Models for all makes 4-wheel drives. Ask your dealer for Warn Hubs next time you see him.

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Seattle 88, Washington

First Lt. Olaf Leifson fires a powerful light beam from an experimental Laser during tests at the U. S. Army Signal Research & Development Laboratory, Fort Monmouth, N.J. The Laser (short for Light Amplification by Stimulated Emission of Radiation) emits a pencil-thin beam of ruby-red light, which can be seen skimming along cardboard reflector. This beam remains in a thin shaft over great distances, rather than spreading like ordinary light. Such devices are being investigated by the Army Signal Corps for advanced communications systems, and for ranging devices that could far outstrip radar in precision.

Signal Corps Studies Light Beams For Communication Systems

Light—one of man's oldest methods of signaling—is undergoing a rebirth as a communications medium through use of the unique pencil-thin beam emitted by a device called the Laser, the Office of the Chief Signal Officer announced on Nov. 16.

This light beam can carry messages, much like a radio wave does, and theoretically it has 10,000 times the capacity of the best radio link. One such light beam could carry more communications channels than all the nation's long-distance telephone lines combined, it is said.

Because of this great communications potential, the Laser (short for Light Amplification by Stimulated Emission of Radiation) is under intense study at the U. S. Army Signal Research & Development Laboratory, Fort Monmouth, N. J. (Information on Bell Telephone Laboratories research on a continuously operating optical maser for high frequency signal transmission appeared in TELEPHONY, Feb. 11, 1961.) From some points of view, the Laser is considered as important an advance as the development of microwaves for communications during World War II, which also increased previous message-handling capability 10,000 fold.

The same type of Laser beam may also provide a means to improve the precision of future defense radar.

One important characteristic of Laser light is that it is "coherent"—that is, the light waves are in step with each other, like soldiers marching in cadence. Light from an ordinary source, such as the sun or an incandescent lamp, is "incoherent" with its light waves radiating in an unpredictable pattern, much like a busy crowd at rush hour.

Since coherent light waves proceed in strict formation, they closely obey the ideal laws of optics. It has been calculated that a Laser light beam a half inch wide, when properly focused, will spread less than 2 feet in a mile. Sunlight focused the same way would disperse as much as 100 yards.

The Laser also produces for the first time light that is so orderly it can be treated like a radio beam. By use of advanced techniques now being explored, coherent light waves could be modified so that each wave carried a small amount of communications information. Since there are about 100 trillion such waves generated per second, an immense message-carrying capability is available. Much research is still needed to harness this great communications potential, the Office of the Chief Signal Officer stated.

Laser light also is obstructed by fog,

IT'S LIKE TWO OPERATORS FOR THE COST OF ONE

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INWARD DIALING IN A 100-LINE PABX

USI research has produced another first in PABX Services. Utilizing the basic type 30 equipment, you can now provide your subscribers with the unlimited advantages of Inward Dialing. For you, Inward Dialing offers the saving of valuable CO Selector Levels and CO Numbers. In addition, Inward Dialing can be added to your existing boards and be compatible with existing type 30 features. For additional information call USI or contact your nearest Graybar man. Get the details, TODAY!

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Over 600 various items of Line Construction Tools, Maintenance & Pressure-Testing Equipment in stock for immediate shipment

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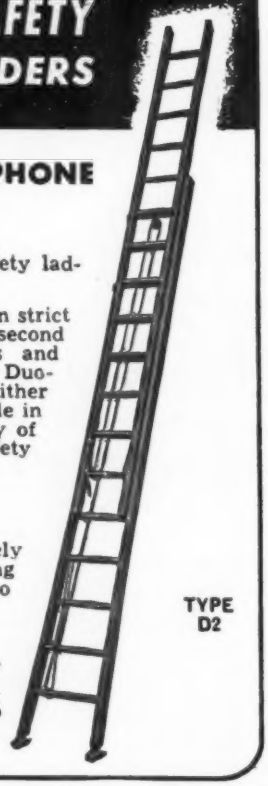

TYPE D2

... CUSTOM DESIGNED FOR TELEPHONE MAINTENANCE WORK!

Here's one fine example of the many Duo-Safety ladders ideal for telephone maintenance work.

Type D — a truly great extension ladder built in strict accordance with safety regulations. Rungs are second growth hickory, reinforced with steel rods and equipped with special automatic locks and Duo-Safety's famous Safety Shoes. Made with either straight or parallel side rails, Type D is available in one, two or three sections — in a large variety of sizes. Write for free catalog on all Duo-Safety ladders.

IMMEDIATE DELIVERIES!

Duo-Safety ladders will be shipped immediately upon receipt of order! A planned stock-piling program assures really fast action — there's no delay the Duo-Safety way!

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rain and other atmospheric conditions, and one way to overcome this might be to beam the light through hollow evacuated pipes for long-distance ground communications links.

Another important characteristic of Laser light is its very sharply defined color, or wavelength. At its particular point on the spectrum it is extremely intense—far brighter than the sun. In fact, it is dangerous to look right at the beam, for extensive damage could result to the eye, even at great distances.

This great chromatic light power is the basis of a potential radarlike device also being explored by Army Signal Corps scientists. By aiming the Laser beam at a far-off object and catching the reflection in a telescopic senser, the object's distance can be precisely measured. Such a Laser-radar would be extremely small and simple, and working with standard radar devices, it could well enhance present detection capabilities.

Operation of a Laser depends upon the fact that an atom will emit a pulse of light when it is released from an excited state. In ordinary light, excited atoms emit their light pulses at random, much like spectators at a baseball game, each shouting or talking at a different time to make a general incoherent noise. Laser light is created when excited atoms release their light pulses in unison, much like the organized shouting produced with the help of a cheer leader at a football game.

In one type of Laser, this orderly light emission is achieved by using a specially-tailored cylinder of ruby about 2 inches long and silvered at each end. The reaction is triggered by an intense surge of ordinary light, which forces chromium atoms in the ruby into an excited state. When the atoms drop back to their normal state they emit a second pulse of light which acquires coherence through multiple reflections from the crystal's silvered edges. The result is a bright beam of ruby-red Laser light.

PBX OPERATION

Continued from page 64

After the lost points have been determined, a grade may be assigned as indicated below:

Grade To Be Assigned

	Total Points Lost	
	20 to 30 Calls	**50 to 75 Calls**
Excellent	0	0
Good	1 to 3	1 to 6
Fair	4 to 10	11 to 20
Poor	11 or more	21 or more.

Plug-Ins Affect Grading

The only exception to this grading assignment is when there is a large number of "plug-ins." No observation shall be rated better than "FAIR" if there are as many as two plug-ins on a 20 to 30 call observation or three on a 50 to 75 call observation. No observation shall be rated better than "POOR" if there are as many as three plug-ins on a 20 to 30 call observation or five on a 50 to 75 call observation.

It would be well to make a written narrative report of every service review contact. The report can be attached to the detail field sheets and filed for future reference. The following is a suggested list of points that should be covered in the narrative report:

- Date contact was made.
- With whom in management contact was made.
- Date narrative report was written.
- Dates and hours study covered.
- Names of attendants and management with whom service review was discussed. If no responsible management person was contacted, why not?
- Brief resume of discussion and reaction obtained.
- Suggestions made for improving the situation. Are they to be adopted?
- If a poor observation was recorded should a follow-up be made in a short while? If not, why not?

Written Report

Since the basic purpose of discussing service review results with customer management and PBX attendants is to provide positive leads in determining training needs for unsatisfactory service conditions, it is important that the written report of the survey be made soon after the observations have been completed.

The value of a written report is lost unless it conveys the actual conditions to be discussed relative to the service results. While the report's contents should be brief, they should be sufficiently complete to give a clear understanding to any person who has occasion to require its information for a follow-up or for future action. This will be accomplished best when reports are written while the subject matter is fresh in the mind of the one who made the survey.

In reporting the results of the survey to the customer, the Service Adviser must carefully avoid sarcasm or ridicule in word or tone of voice. She should be able to express herself in a way that is easily understood. Most

NEW SUPER SAFE ROPE

FIELD TEST PROVEN TO HAVE LOWEST ELECTRICAL CONDUCTIVITY!

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GLADIATOR ...MADE STRONGER ...TO LAST LONGER PAT. PENDING TRADEMARK

POLYPROPYLENE ROPE AND POLYETHYLENE ROPE

Berkley Gladiator Polypropylene rope and Polyethylene rope — from 3/16 to 2" in diameter — is the ideal rope for hand lines, pulling transmission cables, for block tackle, etc. This new rope sheds water and is completely rot-resistant — thus giving it a very low ELECTRICAL CONDUCTIVITY. Extra easy to handle because it is light in weight, yet 50% stronger than manila. It can be easily spliced and carries a stronger knot strength than manila. Berkley's new safe-to-handle Gladiator rope will do a better job for you.

FREE SAMPLE

Please rush me sample, costs and fact sheets on Polypropylene.

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☐ Check here if you want a Berkley representative to call on you.

How much footage of rope do you purchase a year?

BERKLEY & COMPANY · SPIRIT LAKE, IOWA

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Special fittings — miters—short lengths—expanded web sections available, also adapters to claytile, transite and fiber duct.

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Concrete Conduit Corp., 130-01 Northern Blvd., Corona, N. Y. Tel. ILlinois 7-1515
Chicago Pre-Cast Products Corp., 29W629 North Aurora Rd., Naperville, Ill. Tel: EL 5-2700—2701
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Neff Concrete Products Co., 711 Section St., Danville, Ill. Tel: Hickory 6-1016
PRE-CON Limited, Orenda Rd., Brampton, Ontario, Canada. Tel: HUdson 1-3492 (Toronto)
Pre-Con of Quebec, Ltd., Montreal, Quebec, Canada. Home Office: Brampton, Ont. Tel: HUdson 1-3942 (Toronto)
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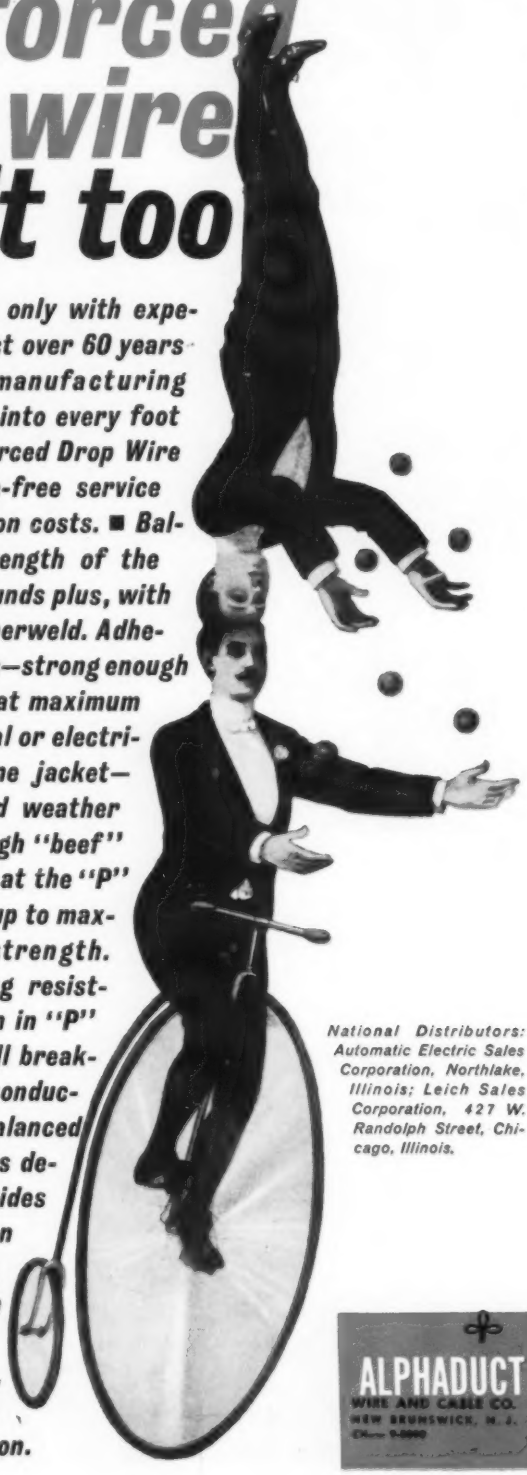
true balance... alphaduct reinforced drop wire has it too

True balance comes only with experience...at Alphaduct over 60 years of technical and manufacturing know-how are built into every foot of Alphaduct Reinforced Drop Wire for greater trouble-free service and lower installation costs. ■ Balanced breaking strength of the conductors—400 pounds plus, with #18 AWG, 30% copperweld. Adhesion of the insulation—strong enough to prevent slipping at maximum load without physical or electrical failure. Neoprene jacket—tough, abrasion and weather resistant with enough "beef" to prevent buckling at the "P" clamps all the way up to maximum conductor strength. Compression cutting resistance—no breakdown in "P" clamps up to overall breaking strength of the conductors. This sturdy balanced construction resists deformation and provides greater protection against lightning failures. ■ Insist on Alphaduct Reinforced Drop Wire... and remember, it's dated for comparison.



National Distributors: Automatic Electric Sales Corporation, Northlake, Illinois; Leich Sales Corporation, 427 W. Randolph Street, Chicago, Illinois.

ALPHADUCT
WIRE AND CABLE CO.
NEW BRUNSWICK, N. J.

customers are not familiar with telephone expressions so the Service Adviser should avoid technical terms as much as possible. Courtesy goes much deeper than mere politeness. It is based on a sincere respect and consideration for other people. It is not always the contents of the report itself that bring about the best results, but often the way in which the report is given to the customer carries most weight.

Information Recorded

The effectiveness with which supervision of a PBX is carried on frequently rests upon the availability of facilities which will permit quick reference to a volume of classified information. The selection of reference records of proper design, the way in which information required by the Service Adviser is classified, and the extent to which she uses such information, is of emphatic concern to the quality of supervision given by the telephone company.

The Service Adviser is in the best position to determine what the PBX customer needs in the way of corrective measures. The information file on the PBX and the results of personal visits and service surveys will team up to combine a job that should prove valuable to the customer and the telephone company alike.

Acme Visible Records, Inc., has developed several forms which can be used for permanently recording conditions that exist at PBX's.

Four Forms Adequate

Fig. 1. (Form 86388-8, Instructional Observation Results) is an excellent form for recapping the information from the field detail sheets of a service survey. It has the same information on both sides of the form which should be sufficient space to build up a very good record of the average service given at the PBX.

Fig. 2 (Form 13271-8) is an envelope sort of a form which will permit keeping all records pertaining to a particular PBX at the Service Adviser's finger tips. On the face of the envelope is pertinent data itemizing the entire physical makeup of the installation. On the back of the form are columns for peg count data, traffic study information and a record of visits to the PBX. All information pertaining to any but the largest of PBX's could be kept in this envelope.

Fig. 3 (Form 93137-8) keeps a record of service observation failures. The back of the form is a duplication of the front. It shows the items which are

charged against the PBX, and items that cause customer annoyance and which could be used in establishing a service index for the PBX, if one is desired.

Fig. 4 (Form 13471-8) provides a check list of items to be looked into during the Service Adviser's visits to the PBX. On the reverse side of this form is a place for data pertaining to the physical makeup of the PBX.

Information for Later Visits

Used properly, these four forms could be combined for the production of data that should prove of immense value to the Service Adviser and other interested parties. They should provide information for subsequent visits. A new Service Adviser would have before her a complete operating and physical history of the PBX and this should make her introduction to the Service Adviser's job an easy transition.

Service surveys are of good value if adeptly handled.

(1) They will help the attendant to develop an understanding of her weaknesses and her strength.

(2) They will let her know she is not being overlooked—that someone is really interested in the job she is doing.

(3) They help the attendant to ascertain her problems before they become too serious.

(4) The Service Adviser should leave the attendant with a feeling that she has been sincerely trying to help her and not just finding fault.

(5) Weaknesses should not be over emphasized. To do so could cause the attendant to lose confidence in herself.

(6) The attendant should be encouraged to develop her own solutions to improve her work. In this way the solutions will be her own objective or goal and not the Service Adviser's.

(7) The Service Adviser should leave the attendant with a feeling of confidence that she can overcome her weaknesses.

(8) A Service Adviser should not talk down to an attendant. There is a common dislike for being under-estimated.

(9) Avoid the unpleasant consequences of being "bossy." Most people dislike the person who wants to control every situation.

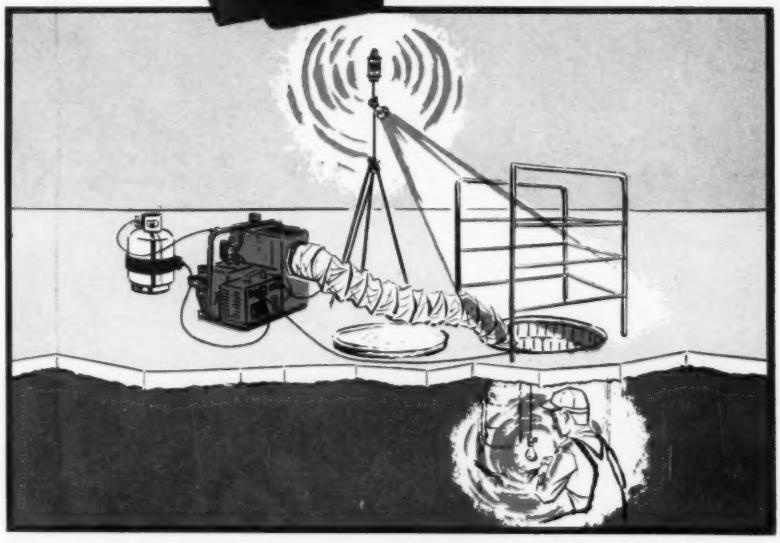
(10) At the close of a discussion, the attendant should know clearly where she stands and what should be done next. She should clearly understand that she can call on the Service Adviser at any time she may need help.

NOW!

you get an

800 watt 115V-AC generator

on the new MoPeCo Model PE-G 800 Ventilating Heater



There's power aplenty in the new MoPeCo generator to provide AC current for high level warning light, area floodlight, electric soldering iron, MoPeCo electric propane bottle warmer and illumination in the manhole area itself. MoPeCo's new model PE-G 800 combines the year round use of a propane operated ventilating heater with a V-belt driven AC generator of increased output. A constant supply of fresh safe forced air, heated fresh air when desired, ventilates the manhole. Four electrical outlets furnish a constant source of AC power—all in a single portable unit. High level flasher is new from MoPeCo, too, for additional safety in illuminating entire work area.

Write for new 4-color brochure showing details, principle of operation and MoPeCo accessories.

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MEASURE ANY DISTANCE *accurately, fast!*

- Records up to 100,000 feet automatically
- Shows inches and fractions of an inch on one side of wheel
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ONE MAN BECOMES A SURVEYING CREW

One man does all the measuring—in one-half the time it takes two men with a tape! Precision measurement over smooth or rough terrain is as easy as walking—and accurate to a fraction of an inch. Accumulated distance is always visible on the totalizer—accurately calibrated inches and fractions clearly legible on the wheel disc. See the complete line of Rolatape measuring wheels at your surveying or engineering instrument dealer or write for complete information today.

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Rolatape
Measuring Wheels

Helpful Literature

SCIENCE, MATH, OPTICAL AIDS—The new 160-page catalog, available from Edmund Scientific Co., is described as listing essentials for production, laboratory work, engineering and quality control, as well as having large sections on new math training aids; reference and refresher books, project kits, and design kits, many of which have professional as well as educational applications.

Included in its data-filled pages are measuring magnifiers, pocket comparators, illuminators, projection sets, and many other instruments and components said to cut costs and speed work in checking, measuring and comparing.

Other equipment included are: many types of microscopes, telescopes and accessories, field range finders, lenses, prisms, wedges, hand and pocket spectroscopes, reticles, mirrors, astronomical telescopes, binoculars and photographic items.

The catalog is well illustrated and needed technical information is incorporated. War surplus optical bargains, many of which are almost seldom seen, are listed.

The new Edmund catalog is recommended as a ready reference and guide to equipment for use by industrial plants, research laboratories, product and design engineers, scientists, inventors, industrial instructors and hobbyists. Request HL706.

•

GENERATOR FOR FALLOUT SHELTERS—A four-page folder answering basic questions about emergency electric power for fallout shelters is now offered by Onan Division of Studebaker-Packard Corp. This brochure has been reviewed by the Office of Civil Defense, and all equipment listed is described as suitable for use with home shelters.

Written in layman's language, the folder answers such questions as:

What is an electric plant?
What are the critical needs for electricity in a shelter?
What kind of fuel is needed for my shelter?
What kind of fuel is needed for my electric generator?
Should the generator be located inside or outside the shelter?
What accessories are needed?

Also, a list of typical electric appliances and their wattage requirements, along with information on how to estimate total wattage needs, is given.

In addition, the brochure includes fuel consumption figures for gasoline and diesel Onan electric plants in the 500 to 2,500-watt range, which are recommended as suitable for fallout shelter use. Fuel consumption figures for bottled gas (important in many areas) are also given. Request HL707.

•

MASONRY ANCHORS AND DRILLS—Catalog number 700, recently revised to include all their new products, has been issued by The Rawlplug Co., and

TELEPHONY PUBLISHING CORP.

608 S. Dearborn St.
Chicago 5, Ill.

Please have the manufacturer send me without obligation the literature indicated by the following numbers:

HL706_____; HL707_____; HL708_____; HL709_____;
HL710_____; HL711_____.

Name .....

Company .....

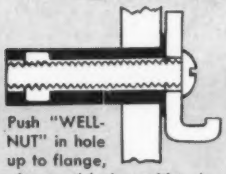
Street .....

Town and State .....

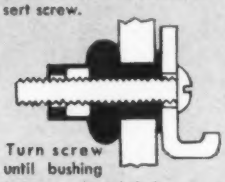
12/2/61

"WELL-NUT"

the ideal blind fastener for many uses in telephony



Push "WELL-NUT" in hole up to flange, place article in position, insert screw.



Turn screw until bushing bulges and seals hole.

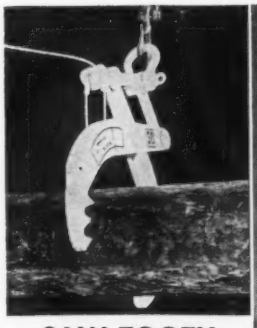
The "WELL-NUT" dampens vibration . . . muffles noises . . . provides an air-tight, water-tight seal . . . has excellent insulating properties. It is a flanged neoprene bushing with a brass nut bonded inside the narrow end. In making an assembly, the narrow end is inserted into a hole in the inner panel until the flange rests against the outer surface. The outer part of the assembly is placed against the flange with the holes concentric. A conventional screw is then thrust into the bushing and turned into the nut, drawing the latter against the inner surface. The tension on the nut causes the bushing to bulge laterally, tightly sealing the hole and the threads of the screw. Access to the inner surface of the assembly is not necessary. The "WELL-NUT" works equally well in hole or cavity. 13 standard sizes; special sizes available in quantity.

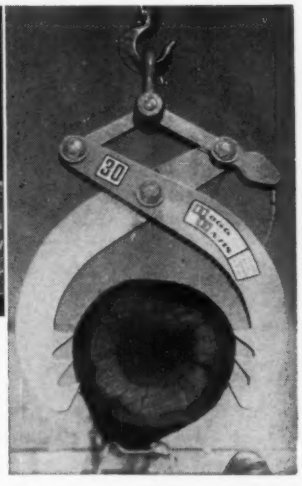
In securing this wall telephone base plate to dry wall, Telephone Companies currently using C-632 Well-Nuts use one or two in the upper slot and one in the bottom slot.

Write For Bulletin and Samples

ROCKWELL PRODUCTS CORPORATION

Dept. H 146 Central Ave., Newark 3, N. J. • MArket 3-7650





SAW-TOOTH POLE TONGS

Will not slip, trip under load

The Tongs are made of high tensile steel, and are available in three sizes:
Number 20 has a 11½ inch opening
Number 30 has a 16¾ inch opening
Number 100 has a 23 inch opening

Timbers and poles are held securely by the triple saw tooth arrangement on the pole tongs. The sure-grip teeth prevent slipping in any direction and permit crane and hoist operators to load and unload without danger to employees. The tongs which will not trip under a load will accelerate pole handling by as much as 50 per cent.

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HIGH FREQUENCY SELECTIVE VOLTMETER

WAVE ANALYZER

MODEL 2173A

SPECIFICATIONS

FREQUENCY RANGE: 3 kilocycles to 2.0 megacycles.
LEVEL: −72 to +32 dbm (full scale).
ACCURACY: ±1 db. −80 to +32 dbm.
SELECTIVITY: 250 cycles
2800 cycles
Wide band (normal IF)
SPURIOUS RESPONSE: Below 60 db.
INTERMODULATION: Below 60 db.
INTERNAL CRYSTAL CALIBRATION for frequency and level. Speaker or headset for aural monitoring.
POWER REQUIREMENTS: 110V AC 50/60 cycles.
WEIGHT: 28 pounds. Portable unit.

The Model 2173A Frequency Selective Voltmeter is an extremely versatile instrument for measuring levels of carrier and subcarrier microwave base band groups. For full information and demonstration, call your nearest Rycom representative or phone: Code #816 — FLeming 3-2100.

Also available from stock:
Model 2171A—Frequency range 50 cycles to 6 kilocycles
Model 2174A—Frequency range 300 cycles to 400 kilocycles

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CONSTRUCTION CO.
2723 Hawkeye Drive
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Complete catalog available on request.

Write today.

contains a complete listing of masonry anchoring and drilling products.

Prepared for purchasing agents, estimators, buyers, and salesmen, the catalog describes and pictures each product.

Complete listing of all sizes and styles is also included. Corresponding drill diameters, packaging and weight information are additional features, Rawlplug states. Request HL708.

•

LARGE ANTENNAS—The new Andrew Corp. catalog, covering large parabolic antennas, is now available.

The patented HUBLOC construction employed by the company, which provides added strength and stiffness while reducing weight, is discussed.

Specifications on 28 and 60 foot diameter reflectors are also given, together with information on antenna feeds, reflector surfaces, supports, mounts and radomes.

The 8 1/2 x 11-inch antenna catalog is well illustrated and convenient for reference. Request HL709.

•

FIGURE-8 TELEPHONE CABLE—Anaconda Wire & Cable Co. has just issued a brochure describing their new low-pair count Compact-8 Telephone Cable, the latest addition to the company's expanding line of Figure-8 cable construction.

Advantages of Compact-8 are: 40 per cent lower weight per 1,000 feet; 50 per cent reduction in cost of hardware per pole; greater speed and ease of installation, characteristic of the Figure-8 construction, the company states.

Compact-8 is standard Alpeth (polyethylene-insulated, aluminum-shielded) construction except that a smooth shield replaces the standard corrugated shield. The messenger is 0.134 inch solid extra-high-strength galvanized steel support wire. A black high-molecular-weight polyethylene jacket is applied simultaneously over the core and messenger.

The brochure provides technical data and electrical characteristics needed for specification of the product. Request HL710.

•

CARRIER EQUIPMENT CHARACTERISTICS—A new "Equipment Characteristics Manual" featuring Lynch Communications' line treatment equipment for carrier telephone and telegraph applications is now available.

Complete descriptions, drawings, specifications and ordering information on Lynch line filters, coupling networks, repeat coils, autoformers, and balance networks are included.

An introduction explaining the purpose of line treatment equipment and its applications; and explanations of technical terms are also included. Request HL711.

A new portable exhibit, designed for school room use by General Dynamics/ Telecommunication and given to the Rochester (N.Y.) Museum of Arts and Sciences, is now being circulated through schools by the museum's school service division. The exhibit consists of three boxes of operating equipment designed so that students can see Stromberg-Carlson switching equipment in a dial telephone exchange and how it works. Three boxes of equipment comprise the exhibit. Included is the power supply (rectifier and transformer), the instrument case containing two telephone instruments and cords for connecting the equipment, and the XY universal switching equipment for commercial dial telephone exchanges. Museum Director W. Stephen Thomas said this operating display marks an important step forward in the museum's program of disseminating information on the physical and applied sciences.

POLE SETTING SIMPLIFIED!

...with "FLEX-CLIP"

- Adaptable to new or old derricks
- No levers, hydraulic lines, or motors needed
- Low cost installation
- The easiest pole handling method

IF YOU HANDLE POLES YOU SHOULD KNOW ABOUT

"FLEX-CLIP"

WELDING SERVICE CO.

85 TULLY ROAD

SAN JOSE, CALIF.

IT'S NEWS!!!

Relief Is Here

Switchboard Operators . . .

the HEADSET TELE-MUFF Jr.®

and TELE-MUFF'S AIR CUSHION®

were made for Your Comfort!

Telephone Companies Contact Your Jobber

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1719 FIRST STREET SAN FERNANDO, CALIF.

Ala.-Miss. Independents Elect Leaders for 1961-62

The convention of the Alabama-Mississippi Independent Telephone Association was held in Birmingham on Nov. 13 and 14 at the Thomas Jefferson Hotel.

The directors who were elected to serve during 1961-62 are: W. F. Corman of Atmore, Ala.; R. C. Corr Jr. of Oneonta, Ala.; Lon J. Darley of Olive Branch, Miss.; immediate past president; D. L. Fail of Bay Springs, Miss.; Ruben Fields of Trussville, Ala.; Cecil Hodges of Rainsville, Ala.; W. J. Holladay of Fayette, Ala.

W. E. Kelly of Union Springs, Ala.; C. E. Kirk of Dothan, Ala.; Charles V. Lee of New Hope, Ala.; Earl McDonald of Ackerman, Miss.; Sid McDonald of Arab, Ala.; J. A. Miller Jr. of Fruitdale, Ala.; DeForest Nolen of Ashland, Ala.

Ralston Robertson of Bayou La-Batre, Ala.; Carl M. Smith of Leeds, Ala.; W. F. Thomas of Eclectic, Ala.; H. W. Vaughan of Fayette, Ala.; L. G. Vaughan of Florala, Ala.; and M. G. Weaver of Collinsville, Ala.

The following officers for the coming year were elected: President, Mr. Lee; first vice president, Mr. Weaver; second vice president, Mr. Hodges; third vice president, Mr. Corr; secretary-treasurer, Mr. Smith; and three honorary vice presidents: Mr. Corman;

Texas' claim to fame as having the first drive-in coin telephone for boats, located at Lake Texoma, has been challenged by Tennessee. A. D. McWhorter, division sales manager of the Southern Bell Telephone & Telegraph Co., takes issue with the comment on the front cover of our Oct. 14 issue that the Texas installation is the first of its kind. He states that the above "float-up, phone up" paystation on Old Hickory Lake outside of Nashville, which was placed in service on Feb. 23, 1961, is the first boatside telephone. Do any of our readers know of any earlier installations?

TBM SERVICE ENTRANCE MAST for OUTDOOR TELEPHONE BOOTHS

U.S. Patent No. 2,977,402.

Model TBM Mast provides complete service entrance facilities for outdoor telephone booths with the definite plus advantages of lower cost and easier installation. Raises power lines for specified ground clearance.

FITS MOST BOOTHS

Meets Code Requirements

LOOKS BETTER The TBM Mast is engineered for the job. Adds to the appearance of any booth.

LASTS LONGER Heavy gauge steel tubing used throughout for life-time service. Only heavy duty fittings used.

COSTS LESS Actual installations show savings up to two-thirds over conventional installations.

REMOVABLE Can be moved from one location to another. Simply disconnect lines and pull mast out of ground sleeve.

Utility Service Co., Inc.

1620 THIRTEENTH ST. RACINE, WISCONSIN

Ward H. Snook of Foley, Ala.; and Mr. Weaver.

GD/T Names Three Veterans In Executive Sales Posts

R. Fred Fairly has been appointed general manager-commercial sales for General Dynamics/Telecommunication. He succeeds T. C. Thompson, who recently was advanced to the position of vice president-sales.

Mr. Fairly has been associated with the telephone business for 33 years, and is widely known throughout the Independent telephone industry.

As general sales manager, Mr. Fairly will direct the activity of the nationwide Stromberg-Carlson commercial sales force. Sales managers in the five branch offices—Atlanta, Chicago, Kansas City, Rochester and San Francisco—will report directly to him.

His latest assignment was as sales manager of the Kansas City Branch. He will be replaced in that position by Raymond E. Hoffman.

Mr. Hoffman is returning to the Midwest after a four-year stay in the Rochester, N. Y. office. He had previously served as a sales engineer in the Chicago branch office for 10 years. His most recent position was as national chief sales engineer.

James D. Confeld has been appointed chief sales engineer, and will direct national sales engineering activities and personnel for switchboard, toll ticketing and carrier-multiplex product lines. He will coordinate proposals, contracts and engineering specifications between the in-plant departments and branch office sales personnel.

Most recently, Mr. Confeld has been product analyst for the marketing research department.

R. F. FAIRLY

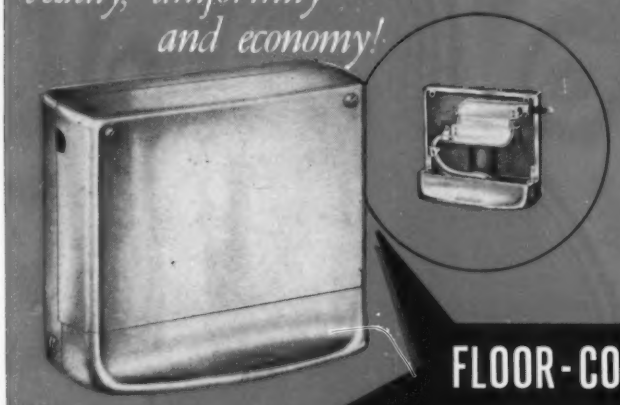
Born in Oakland, Calif., Mr. Fairly attended schools in Long Beach, and was graduated from Texas Technological College in Lubbock.

R. E. HOFFMAN

His earliest telephone experience was gained while he was in high school, when he served with the Associated Telephone Co. of San Bernadino, Calif.

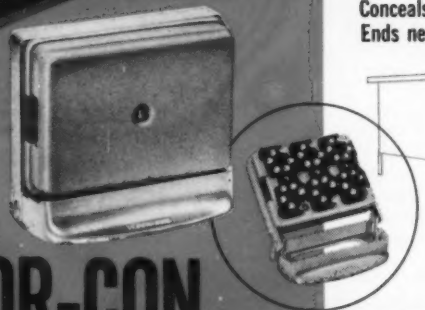
Mr. Fairly's first full-time job was with the Haskell (Tex.) Telephone

beauty, uniformity and economy!



MODEL 103 encloses Amphenol plugs and jacks

MODEL 102 WITH STANDARD TELEPHONE COMPANY COVER



FLOOR-CON allows all telephone work to be completed in advance of moving. Approved and specified by telephone companies, FLOOR-CON is used exclusively in many large buildings in business, industry and government. Attaches to all makes of underfloor ducts, floor boxes and single conduits through the floor. All necessary fittings will be supplied to adapt Floor-Con to your particular duct system or Floor Installation — specify type and make in use.

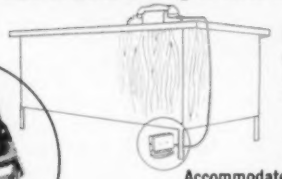
Model 103 includes the matching cover in chrome or brass satin finish. The cover encloses the amphenol plugs and jacks when used with key telephone sets or other complex equipment.

Additional connecting blocks and miscellaneous equipment can be mounted on the back of all models.

IF NO CONDUITS ARE PROVIDED, FLOOR-CON CAN BE SCREWED DIRECTLY TO THE FLOOR. NO FITTINGS ARE NECESSARY.

FLOOR-CON TELEPHONE FLOOR CONNECTOR

Conceals all wiring—Desks are free from telephone equipment
Ends needless marring of office furniture PAT. #2854166



Model 102—
Chrome or brass satin finish. Accommodates 3 44A Connecting Blocks.

Model 104 (Not Shown)
Chrome or brass satin finish. Accommodates 4 44A Connecting Blocks.

For catalog information and prices, write:

FLOOR-CON 759 NORTH SPRING STREET / LOS ANGELES 12, CALIFORNIA / MAdison 4-5400

DISTRIBUTED BY
GRAYBAR ELECTRIC COMPANY

Co. Later, he was in plant engineering in Lubbock and at Santa Monica, Calif.

He joined the Stromberg-Carlson research department in 1942, and subsequently transferred to the sales department. He served as a sales engineer at the San Francisco office from 1947 through 1955 until he moved to Kansas City as branch manager.

Mr. Fairly is a licensed professional engineer in the state of California. He is also a member of the Armed Forces Communications Association, and was formerly a member of the American Institute of Electrical Engineers.

In his new position as Kansas City branch sales manager, Mr. Hoffman will direct the sales activities for Stromberg-Carlson products in a 10-state territory.

Mr. Hoffman started his career at Stromberg-Carlson in 1941 in the switchboard assembly department. After periods in drafting and systems engineering, he moved to the Midwest sales engineering post.

He is a native of Rochester, N. Y., and received his early education there.

He attended the University of Alabama, and majored in electrical engineering.

Mr. Confeld joined Stromberg-Carlson in 1944 after receiving his

J. D. CONFELD

electrical engineering degree from Michigan College of Mining & Technology.

He served as a member of the research staff and as a field service engineer, and prior to becoming product analyst for the marketing research department, was a staff engineer in the systems planning group, and a section head in charge of toll ticketing development.

Mr. Confeld holds several patents in the telephone switching and toll ticketing fields. He lectures on various telephone subjects.

He is a member of the American Institute of Electrical Engineers, and of the American Marketing Association.

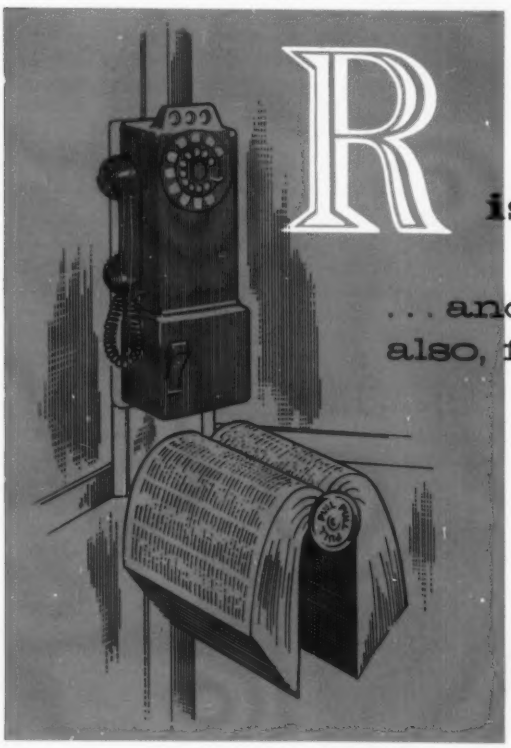
Hagler Heads CF&I Wire Rope Sales in N. Cal.

G. D. Hagler has been appointed manager of wire rope sales for the Colorado Fuel & Iron Corp. Northern California district, it has been announced by J. N. Counter, general manager of commercial steel sales and J. H. Driggs, manager of wire rope sales for the corporation's Western Division.

Mr. Hagler, who joined CF&I in 1952, was formerly manager of wire rope sales for the corporation's Southern California district. He has held various sales posts with CF&I in Denver, Colo.; Lincoln, Neb.; Palmer, Mass., and Oakland, Cal.

In his new assignment in northern California, Mr. Hagler will make his headquarters at 425 Hester St., San Leandro.

A native of Filer, Ida., Mr. Hagler holds a B. S. degree in mechanical engineering from the University of Colorado.



R is for RACKS

... and for REVOLVING
also, for more REVENUE

Easy to Use — Customers like it.
Saves time. Eliminates Binders.

BEST BOOTH PRODUCTS
by BENNER-NAWMAN, INC.

For full particulars, consult your distributor or write direct... Benner-Nawman, Inc., 3421 Hollis Street, Oakland 8, California

presenting . . .

Gift Items
with Princess emblem
Immediate Shipment

T714 Gold Plated
Bangle Bracelet

WALT BARBER Advertising Specialties
AREA CODE 404 CEdar 3-5478
BOX 11927 • ATLANTA 5, GA.

KILLOREN
of WISCONSIN
established in 1926

Fully Equipped to Furnish:

Complete construction crews

Cable splicers

Buried cable crews

Station installers

Right-of-way clearing and maintenance

Main office:
136 N. STATE STREET
APPLETON, WISCONSIN
Phone REgent 3-5549

Motorola Appoints Bailey National Account Executive

Holmes Bailey has been appointed national account executive for Motorola Communications & Electronics, Inc.

In announcing the appointment Homer Marrs, vice president of sales, said Mr. Bailey will be responsible for the sale of portable and mobile radio communications equipment to telephone companies. This includes two-way radio, radio-telephone and VHF radio paging products.

Before joining Motorola, Mr. Bailey was product manager for communications equipment for AC Spark Plug Division of General Motors. He has also served as assistant to the vice president of field engineering and

HOLMES BAILEY

sales for Aircraft Radio Corp., Boonton, N. J.

Bailey holds a master of science degree in marketing from Massachusetts Institute of Technology. He also holds a bachelor of science degree in physics.

Gold-Panning and Tour Mark Nome, Alaska, Cut-over

A gold-panning and sightseeing tour marked the end of the ceremonies in Nome, Alaska, when the Nome Telephone Co. recently cut over its exchange to automatic operation.

Equipment in this "farthest north, farthest west, Class 1 city in the continental U.S.A." is a 360-line, 600-terminal switchboard, made by Automatic Electric Co., initially serving 453 stations.

In addition to services usual in an exchange of this size, the equipment provides fire conference service, with an automatic tie-line between the police and fire departments.

The equipment was officially placed in service when Mike Walsh, a Nome

Mike Walsh, 40-year subscriber, makes first call after Nome, Alaska cut-over to Alaska Sen. E. L. Bartlett in Washington, D. C.

Telephone subscriber for 40 years, made the first call, to Alaska's Sen. E. L. Bartlett in Washington, D. C. It was 4 a.m. in Washington when the call was placed at 9 p.m. in Nome.

Though Mr. Walsh is now its "oldest" subscriber, telephone service in Nome dates back to 1905, when Alaska Telephone & Telegraph Co. was organized to serve Nome and a number of surrounding mining communities. The present Nome Telephone Co. was organized in 1958, with 362 stations served by a central-battery manual switchboard. Officers are: Pete Reader, president; Tom Martin, treasurer; Mrs. Pete Reader, office manager.

Send Invitations to '63 Ski Meet Via New Alaska System

Trans-Alaska Telephone Co., Anchorage, and the Alaska Communications System (ACS) combined their facilities on Nov. 21 to issue by long distance telephone call the first invitation to the 1963 Alpine Ski championship meet to be held at Girdwood, Alaska.

Jim Branch, general manager of The Alyeska Ski Corp., speaking in French, placed the call from a public telephone in Girdwood to Miss Lilliane Anjere of Paris, France, a member of the French ski team who will participate in the international meet.

Mr. Branch explained that the call was being made over the new telephone system available to Girdwood subscribers. This, and all other telephone invitations relative to the meet were by courtesy of Trans-Alaska Telephone.

Formal dedication of the Trans-Alaska building in Girdwood took place after the call to Paris, and an open house was held.

CABLE-KOTE

The NEW AID to Cable Maintenance

CABLE-KOTE is a water repellent specifically designed to eliminate costly breakdowns.

CABLE-KOTE is a non-conductive chemical formula in liquid form and can be pushed through a cable while the lines are in operation.

CABLE-KOTE is a permanent treatment since it is shielded by the outer sheath from ultra-violet rays. It will not deteriorate insulation in anyway once the cable has been treated.

CABLE-KOTE may be pushed through plastic or lead covered cables of any size with dry air or nitrogen the excess being retrieved and used again. The small amount that adheres to the inner parts of the cable will dry out and become an integral part of the cable.

CABLE-KOTE has been proven to have restored lines deteriorated from electrolysis by filling pin holes in the sheath.

Pentachloraplenol added against attack by insect or larva in cable.

For information write:

Vincent & Vincent, Inc.

P. O. Box 65 • Windsor, Calif.

NOW—MORE THAN EVER BEFORE— YOU GET GREATER VALUE IN THE "ABC OF THE TELEPHONE" BOOKS

The four "ABC OF THE TELEPHONE" books are reprinted from the popular series of training articles by Frank E. Lee, currently appearing in TELEPHONY.

A partial list of the topics discussed in the 97 chapters of this big 393-page, four volume set includes:

Transmitters, receivers, relays, station protection, drop and station wire installation, fault locating, loading coils, batteries, rectifiers, electronic tubes, carrier, community dial offices, wiring diagrams; selecting, placing, guying, anchoring of poles; cable plant and open wire construction, transpositions, line concentrators.

Many telephone companies order a complete set of ABC books for each of their plant men.

These low quantity prices will save you money—

COPIES	VOL. 1	VOL. 2	VOL. 3	VOL. 4
1- 10	$1.50 ea.	$1.50 ea.	$2.50 ea.	$2.50 ea.
11- 50	1.35 ea.	1.35 ea.	2.25 ea.	2.25 ea.
51- 200	1.20 ea.	1.20 ea.	2.00 ea.	2.00 ea.
201- 500	1.05 ea.	1.05 ea.	1.75 ea.	1.75 ea.
501-1000	.95 ea.	.95 ea.	1.60 ea.	1.60 ea.

Send us your order today.

FRANK E. LEE, Publisher

1751 — 183rd St. • Homewood, Illinois

AWARDS IN STERLING SILVER

(actual length of bracelet is 7 inches)

#0 BRACELET (no charms) in double link & with safety chain

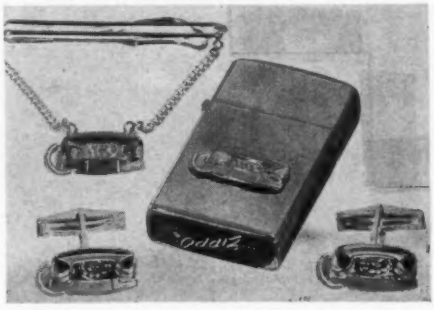
In Sterling Silver	$6.95 each
in lots of 12	5.60 each
In Gold filled	8.95 each
in lots of 12	7.60 each

#1 through #7 telephone charms

In Sterling Silver	$1.70 each
in lots of 12 (same or assorted)	1.50 each
In Gold filled	2.50 each
in lots of 12	2.25 each

Charms are also available in 10-K or 14-K gold at higher prices.

Our charms have been created as incentive awards and are available only through management of your Company.



CUFF LINKS with #1, 2 or 3 Telephone design

In Sterling Silver	$6.00 each
In Gold filled	7.00 each

TIE TACKS with safety chains & with #1, 2 or 3 design

In Sterling Silver	2.15 each
In Gold filled	2.50 each

TIE BARS OR TIE CHAINS

In Sterling Silver	$4.85 each
In Gold filled	5.25 each

BRUSH CHROME ZIPPO LIGHTER with choice of Sterling Silver emblem	$5.15 each
SLENDER, POLISHED CHROME ZIPPO with Sterling Charm	6.25 each

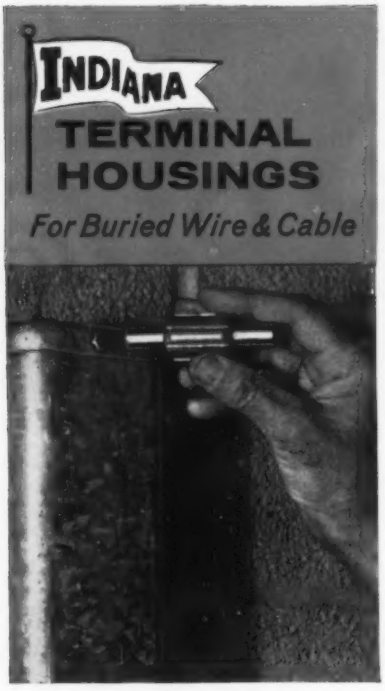
All prices include taxes & postage

Individuals may order all items except charms

HOMER MILLER COMPANY

JAckson 5-0568

P.O. Box 31 OKLAHOMA CITY 1, OKLA.



ENGINEERED TO SAVE YOU TIME AND LABOR

ONE screw like this is all that's required to complete the assembly of INDIANA Pedestal-Type Terminal Housings. This is typical of the time and labor-saving features to be found in these carefully engineered housings for buried wire and cable.

Made of heavy gauge steel and galvanized AFTER forming, INDIANA Terminal Housings provide long-lasting protection to terminal blocks, loading coils and/or splicer. Both pedestal and pole-mounted types, designed to accommodate from one to 400 pairs, are available.

Ask your distributor about these dependable, economical housings, or write for Bulletin No. TH-101R.

INDIANA
Steel & Wire Company, Inc.
Muncie, Indiana

"Look to the Wealth of W. Va.," C&P Urges in Advertising

Spotlighted in national magazine articles and in news reports on the pivotal 1960 presidential primary election as a depressed area, West Virginia and its people seemed to have become preoccupied with the state's liabilities and forgetful of its assets.

Because of this attitude, on Oct. 4, the Chesapeake & Potomac Telephone Co. of West Virginia, began an ambitious advertising campaign to remind West Virginians of the assets their state possesses. Theme line of the campaign is "Look to the Wealth of West Virginia."

Response to the initial ad (see cut), which ran three times in 27 daily and 65 weekly newspapers, was described by a spokesman for N.W. Ayer & Son, Inc., Chesapeake & Potomac's advertising counsel, as "widespread and impressive." A C&P executive reported that the company is receiving "extraordinary praise," both in letters from the public and in the editorial columns of West Virginia newspapers.

The first advertisement in the series of eight is headlined "What is a Hillbilly?" and is written in the form of a "guest editorial" by J. Franklin Comstock, publisher of the West Virginia *Hillbilly Weekly*.

"A hillbilly," Mr. Comstock says," "is someone who can't look out his window without seeing the big hills,

Look to the wealth of West Virginia

What is a Hillbilly?

by J. FRANKLIN COMSTOCK
Publisher, The West Virginia Hillbilly

A hillbilly is someone who can't look out his window without seeing the big hills, and feeling small and big at the same time because of them.

He's somebody with a heritage of independence his hill-folk family gave him, because—cut off from other people by the mountains—*they* had to make it by themselves. Someone stubborn and tenacious because he's learned that while faith can move a mountain, it might take a little time.

He's friendly, because mountains teach that there are more important things to fight than people—and that if your closest friends are both sides of a mountain distant, they're better held onto than fought with. And he's industrious. Even living *lazy* in mountain country can work a man pretty hard.

He's somebody who knows that only God can make a tree—and figures that if He troubled to make a whole state of forested mountains, that state must be specially blessed.

A West Virginia hillbilly is a man with wealth underfoot, wealth towering over his head, and only the beauty all around him coming easy. He has his troubles—but plenty of toughness and faith to stick it out, sometimes looking poorer than he feels, until it's time.

Now it's time.

I've been told I should change the name of my paper, the "Hillbilly." Somebody quoted me Webster's definition of that awful word. Well, I'm a hillbilly, and I told him, let Webster change his *definition*. The only kind of person I know, in West Virginia, who apologizes now for being a hillbilly, is the fellow who isn't sure but what he is one, in Webster's sense.

We're losing some people from our hills to the flatlands of other states. All right, this may be the way of our country. The good ones want to come back, and will, better experienced and trained than ever. We've lost and gained people for years, and gained on every trade.

And have you noticed, those who come here are as proud as the most deep-rooted of us to be known as hillbillies? I had a poll about changing the name of the "Hillbilly." Including native and new West Virginians, schoolteachers, doctors, lawyers, technical men, the vote was 30 to 1 to retain the name. People like this are changing the old definition so fast that those who bristle at the word are dwindling in number. And that's good.

This state has got some doing to get done. And how well we do it depends on our opinion of ourselves. No one is going to respect the hillbilly more than we do.

Stubborn hillbillies tended and tamed these mountains, with patience and faith, waiting for the time.

Now is the time.

Now, we're getting the roads. We've got the technology to reap the rewards of our waiting. We're developing our tourist attractions, our cultural potentials, magnets to bring people to us to find out about the hillbilly of today, to prove Webster old-fashioned.

Why not give that stubborn, tenacious, independent hillbilly—the real backbone of all of us—credit for what he laid the foundation of? Let's hope we have the guts to live up to him, facing the wonderful, favorable odds his grit preserved for us. Take away his name and you take away the credit from him.

Somebody asked George Washington what he'd do if it looked as if he were losing the war. He said, "Give me but a banner to plant upon the mountains of West Augusta"—their name for this area in Washington's day—"and I will gather around me the men who will lift our bleeding country from the dust and set her free."

He knew his hillbillies.

This is just the first in a series of messages we'll be bringing you on the greatness—in resources, people, traditions—of our state of West Virginia. Reminders only; for we know you share our pride in the Mountain State . . . and our determination to have it ready for the challenge of its second great century. Ready in every way—including the communications needs of its growing industry and population.

We hope you enjoy the series. Won't you let us know?

H. M. Ellington
VICE PRESIDENT

The Chesapeake and Potomac
TELEPHONE COMPANY OF WEST VIRGINIA

and feeling small and big at the same time because of them. . . He's friendly, because mountains teach that there are more important things to fight than people . . . And he's industrious. Even living lazy in mountain country can work a man pretty hard.

"A West Virginia hillbilly is a man with wealth underfoot. . . He has his troubles—but plenty of toughness and faith to stick it out, sometimes looking poorer than he feels, until it's time.

"Now it's time . . . This state has got some doing to get done. And how well we do it depends on our opinion of ourselves. No one is going to respect the hillbilly more than we do. Stubborn hillbillies tended and tamed these mountains . . . waiting for the time.

"Now is the time. Now, we're getting the roads. We've got the technology to reap the rewards of our waiting. We're developing our tourist attractions, our cultural potentials, magnets to bring people to us to find out about the hillbilly of today. . ."

After reviewing the program and the first ad, Gov. W. W. Barron called it "One of the best promotions for West Virginia I've seen."

In a lead editorial, the Huntington *Herald-Dispatch* said, "the correction of a distorted image and the reawakening of citizen appreciation for a great, but much maligned, state make up an undertaking of singular value. Not the least of its attractions and prospects of success stem from its commercial sponsorship . . . For this excursion into a dynamic field of public service, above and beyond the call of materialistic salesmanship, we salute the Chesapeake & Potomac Telephone Co. of West Virginia."

Several newspapers called attention to the advertisement in news stories. One headlined a bold face box on page one, "Please Read It." At least two radio commentators read the complete text of the ad over the air.

W. M. Ellinghaus, vice president of C&P, pointed out that the campaign is a departure from normal Bell System advertising in that its purpose is not telephone-centered.

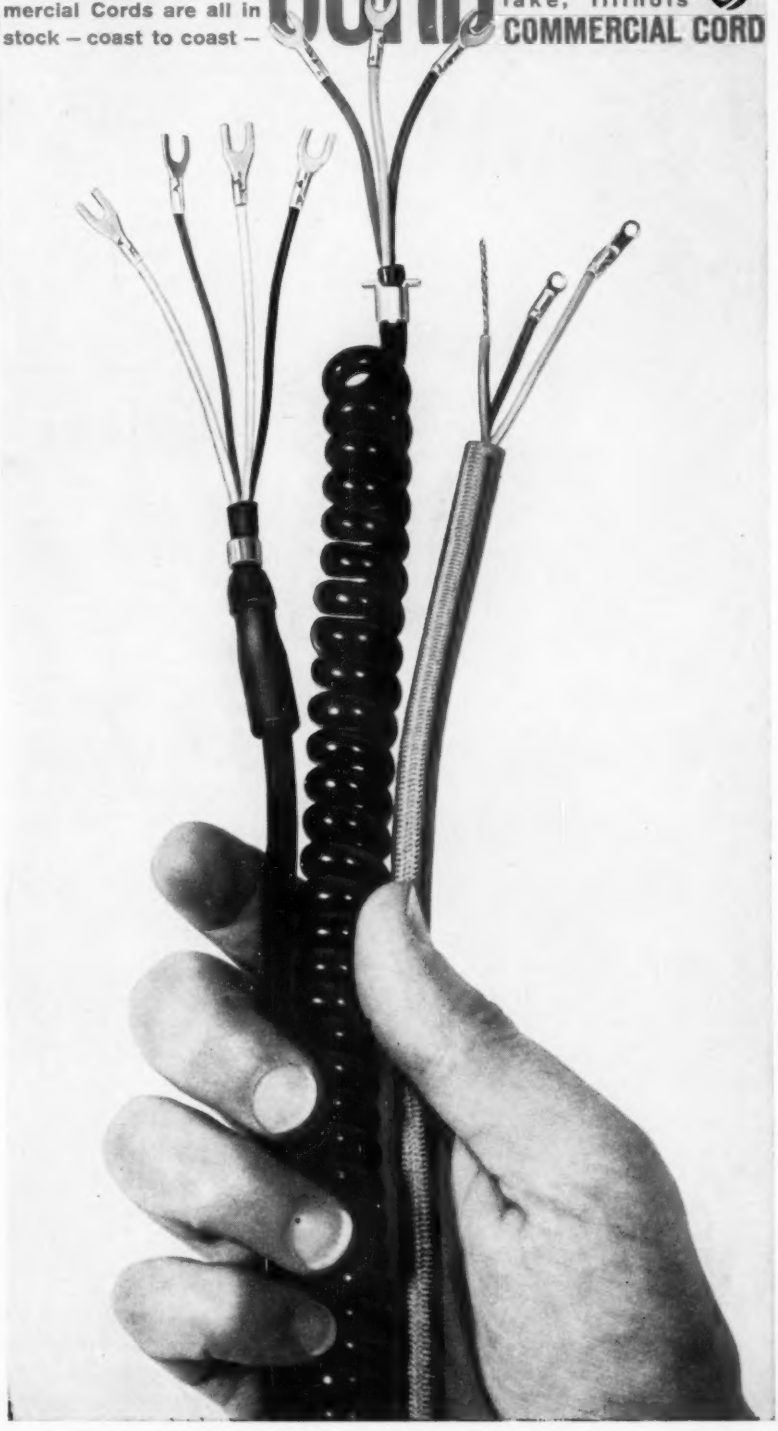
He said: "We, as a corporate citizen of West Virginia, are undertaking to help end the negative, persecuted feeling that appears to have existed in our state during the recent period of economic change. Newspaper advertising will by no means be the extent of our effort. In all of our activities, where appropriate, we will urge people to 'Look to the Wealth of West Virginia.'"

Chesapeake & Potomac's second "wealth" ad, based on a statement by former West Virginia Gov. Homer A. Holt, was to appear in 92 newspapers starting the week of Nov. 13.

...any cord. Commercial Cord has it! Patch cord, test cord...phone or intercom...straight cord or Spiraflex®...nylon jacket or colored PVC...standard, or any length or termination—Commercial Cord makes them all! ■Want cords fast? Commercial Cords are all in stock—coast to coast—for fast shipping to you. ■Get catalog, samples, prices from Commercial Cord Co., Clifton Springs, N.Y. Distributed by: Leich Sales Corp., 427 W. Randolph St., Chicago 6, Ill.; Automatic Electric Sales Corp., Northlake, Illinois

PiCKa CORD

COMMERCIAL CORD



WHY GUESS?—KNOW!

TP-14 Signal Corps

VF REPEATERS

TRUNK OR SUBSCRIBER LINES DIAL OR MANUAL

Intermediate or End-Used as 21 or 22 Type 12 to 18 DB gain (2 or 4 wire or both) 115-230 VAC or 12 VDC, Building-out network & protection built-in, weatherproof wood case removable for 19″ rack mtg. Brand new.....**$99.50**
Good used..... **75.00**
Manual Loaned free or shipped on approval

TRANSMISSION MEASURING SET

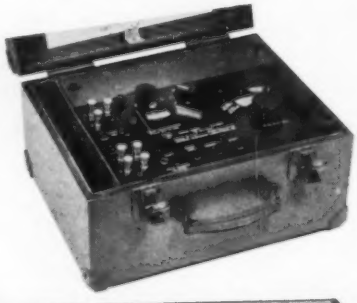
WITH OSCILLATOR & PHONE

Osc. 500-1000-2500 cycle at 0, −20, −40 DB level into 600 ohm load.

TMS Range 100 to 10,000 cycle −50 to +15 DBM in ½ DB steps from 600 ohm source.

Phone EE8B Army Field Telephone (LB & CB) built-in. Complete with 70 page manual and fresh batteries and test leads.

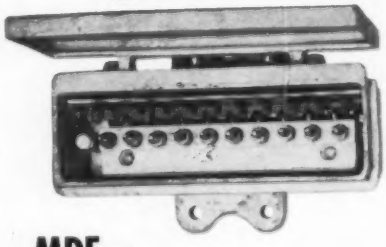
1 61 (ANPTM 3) new.....**$99.50**
slightly used A-1..... **75.00**



WHEATSTONE BRIDGE

SLIDE WIRE TYPE (FAST)

L & N slide wire and galvanometer quick and accurate DC resistance measurements for locating grounds, crosses and shorts. Has vacuum tube oscillator for opens and capacitance tests at 20 cycle. TS 27/TSM with batteries and manual, NEW **$99.50**
Slightly used A-1 ..... **75.00**
TS 27B/TSM, later type, in metal case (same features) NEW **$125.00**
Used A-1..... **100.00**



OPEN WIRE PROTECTOR

WE #83A (#84A mtg, in galvanized iron box with hinge cover. Complete with #26 and #30 discharge blocks.)

NEW .....each **$2.50 in lots of 12**

NEW.....each **$3.00 for less than 12**

MDF—

Cook #100 Protectors NEW 20 pair groups, fully equipped **$15.00**
Unused, tested surplus **10.00**
Western Electric #1268B, 23 pair group, fully equipped, with flange on rear for wall mtg., NEW **15.00**
#1269A, 20 pair group, NEW **12.50**
good used **10.00**
#1435W, 20 pair, wired to maple terminal block, NEW **12.50**
#1435U, 20 pair fuse group **5.00**
Automatic Electric #675, 21 pr. with alarm circuit, NEW **12.50**

MOST EVERYTHING FOR THE INSIDE & OUTSIDE PLANT
FULLY GUARANTEED—SHIPPED ON APPROVAL

NOTE Test sets described here are quality equipment designed by the U.S. Army Signal Corps with the assistance of the best men in the industry. Highly trained test men are not required to properly operate this equipment. This is post-war material manufactured in 1952 or later—just released and is fully guaranteed. Each set is tested before shipment—TRY IT AT OUR RISK.

the TELECTRIC CO.

1218 VENICE BOULEVARD
LOS ANGELES 6, CALIFORNIA
Richmond 8-2249 (DDD 213)

DAN MAC
DIAL REBUILDING

DIALS REBUILT BY THE DAN MAC PROCESS GIVE THE SAME APPEARANCE AND SERVICE AND CARRY THE SAME GUARANTEE AS NEW.

TELEPHONE REPAIR & SUPPLY CO.
1760 Lunt Ave.
RO 4-3817 Chicago 26, Ill.

EVERY MONTH
More and More Telephone Companies use DIRECTORIES produced by
Your Inquiry Respectfully Solicited
LELAND MAST DIRECTORY COMPANY
1619 GREENWOOD WILMETTE, ILL.

CALL — WRITE — WIRE
"AMERICA'S FOREMOST CABLEMEN"
Aerial and Underground Engineering and Construction Service For Telephone Companies
LARGE OR SMALL
U. S. CABLE CONSTRUCTORS, INC.
2002 E. Wisconsin Ave. P.O. Box 378
REgent 4-9881
APPLETON, WISCONSIN

DIALS
Dial Haven Reconditioning Service provides expert workmanship plus genuine and improved parts to insure long life for your telephone dials.
DIAL HAVEN INC.
P.O. Box 655 Monroe, N. Y.
Code 914 783-2221

CABLE CONSTRUCTION CO.
1512 Center St. Tacoma, Washington
ENGINEERING - CONSTRUCTION
SPLICING - CABLE PLOWING
CENTRAL OFFICE INSTALLATION
World-Wide

CABLE SPLICING
LINE CONSTRUCTION
CABLE PRESSURIZATION
SYSTEMS ENGINEERED AND INSTALLED
UTILITIES CONTRACTING CO.
211 Custer St., Lansing, Michigan
Phone—IVanhoe 25248

POLES • CROSSARMS
RAIL or TRUCK DELIVERY
Pressure-treated to your specifications. 16 sales offices, 34 plants serving you. See Yellow Pages, write or call Pittsburgh EXpress 1-3300.
C-12
KOPPERS COMPANY, INC.
Wood Preserving Division
757 Koppers Bldg., Pittsburgh 19, Pa.

CREO & PENTA TREATED **POLES**
"from the Nation's Largest Plant"
DIERKS FORESTS, INC.
NA 3-7766 Hot Springs, Ark.

POLES

Cascade Pole Co., P.O. Box 743, Tacoma, Wash.—Creosoted Douglas Fir and Cedar Poles.

C. M. Christiansen Co. — Northern White Cedar Poles, Pentachlorophenol treated. Plant and Yards, Phelps, Wis.

Eppinger & Russell Co., 80—8th Avenue, New York 11, N. Y.—Creosoted Poles and Cross Arms. Plants: Jacksonville, Fla., Norfolk, Va., Eddington, Pa.

International Creosoting and Construction Co., Galveston, Texas—Creosoted Southern Yellow Pine Poles. Plants Beaumont and Texarkana, Texas.

International Paper Co., Wood Preserving Division—926 Grand Avenue, Kansas City, Missouri—"LONG-BELL" pressure-treated Southern Pine and Douglas Fir Poles—Creosote or Penta.

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TELEPHONES—all types—any condition, candlesticks, wall sets, etc. Write advising quantities available. Our trucks will pick up. Reply to Box No. 3952, c/o TELEPHONY.

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LIKE NEW 901—Wall or desk Magneto telephones with Koiled Kords and connecting blocks; $15.00 each. Write Telephone Co., Turtle Lake, Wis.

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LEICH 901, Leich 86A, and Stromberg-Carlson 1248 telephones. Write Cochrane Co-op. Telephone Co., Cochrane, Wis.

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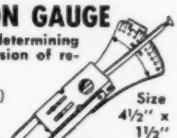

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ALTEC TELEPHONE REPEATER AMPLIFIERS

TRANSISTORIZED PLUG-IN TYPE

ALTEC plug-in repeaters are compact packages of gain (37 db) for voice frequency amplifier applications. Transistorized for appreciable power economy, cool operation, and long life, these units eliminate need for costly 130 v power supply.

ALTEC Model No.	DC Operating Voltage (volts)	Current Drain (ma)	Input/Output Impedances (ohms)
447B	20	50	600
449A	20	25	600 or 150
453B*	24-26	22	600
454A	48	25	600 or 150
455B*	48	22	600

*Center tapped input and output for DC Simplex operation

ALTEC PLUG-IN TRANSFORMERS

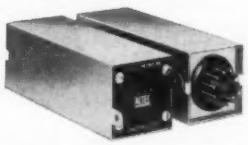
15189 HYBRID TRANSFORMER Used in pairs to form hybrid circuit for two-wire to four-wire transitions in voice frequency telephone systems. Feature high degree of trans-hybrid loss. Impedances: Two-wire 600 ohms or 900 ohms, four-wire 600 ohms. Trans-hybrid Loss: 55 db 200-1000 cps, 52 db 2000 cps., 50 db 3000 cps. Maximum Operating Level: + 10 dbm. Current Capacity Signal Winding: 150 mas. Maximum Out of Balance Current Signal Winding: 150 mas. Dimensions: 3 7/16" H x 2" D x 1 1/2" W.

15192 LINE TRANSFORMER — Impedance matching drop side to telephone line and enables by-pass signaling circuits to be derived at center of its line windings. Impedances: Drop — 600 ohms, Line — 600 ohms or 900 ohms with signaling facilities at center of windings. Without signal facilities with windings in parallel 150 ohms or 250 ohms. Frequency Response: ± 1 db 100-10,000 cps. Maximum Operating Level: + 20 dbm. Maximum Current in Line Windings: 100 mas. Maximum Out of Balance Current in Line Windings: 100 mas. Dimensions: 3 7/16" H x 2" D x 1 1/2" W.

ALTEC 13530 COMPROMISE NETWORK

Used with ALTEC 15189 Hybrid Transformers to obtain compromise hybrid balance in two-wire to four-wire transitions at PBX locations.

ALTEC PRECISION NETWORKS

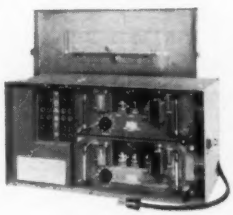


13531 NETWORK — Enables precise hybrid balance to be obtained against H88 type loaded cable circuits.

13532 NETWORK — Enables precise hybrid balance to be obtained against non-loaded cable circuits.

ALTEC S-17 AMPLIFIER SYSTEM

Two program quality 437B Amplifiers, two 17224 Equalizers, and two jack fields are housed in a single portable cabinet that is also rack mountable. Provides highest quality program transmission and may be used for certain types of carrier or data transmission applications. Features very wide frequency capability and excellent delay distortion characteristic.

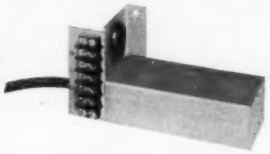


ALTEC 529A POWER SUPPLY

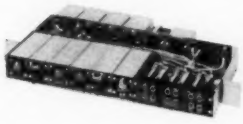
Energizes up to 100 ALTEC transistorized repeater amplifiers. External Power Available: 20 v DC @ 3 amps; 0.3 amp @ each of 10 separate outlets. Maximum Ripple Content is 0.002 v. Features DC voltmeter and rotary selector switch for checking each distribution outlet. Mounts in 19" relay rack and occupies 3 1/2" of rack height.

ALTEC 533A POWER SUPPLY

Mounts single ALTEC 449A or 453B repeater amplifier. Two of these power supplies with amplifiers may be installed in one standard apparatus box.

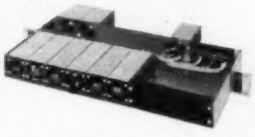


ALTEC 7300 TELEPHONE REPEATER TERMINATING UNIT



Provides rapid, simple means of establishing repeatered VF telephone channels for general telephone, telegraph, and teletype circuits, and PBX installations. Circuit components are ALTEC plug-in type which may be assembled for two-wire to four-wire termination, four-wire intermediate, and two-wire to two-wire systems. An insulated jack mounting block with 12 jacks permits routine system testing. Entire fully wired panel assembly mounts on standard 19" relay rack; occupies only 1 3/4" rack height.

ALTEC 7302 LOUDSPEAKING TELEPHONE SYSTEM



New fully transistorized system enables many talkers to participate on a telephone connection in inter-office conference calls when associated with 510 type telephone set or equivalent and a cardioid microphone and loudspeaker. System is complemented with ALTEC plug-in transformers, amplifiers, network, and associated equipment. Powered from central office or PBX quiet battery supply (24 v DC) or from regulated power supply.

ALTEC TRANSISTORIZED PLUG-IN AMPLIFIERS

460A TELEPHONE REPEATER, COMPRESSOR — Provides compression characteristic of 3 to 1 (db conversion factor) to enable sensibly constant speech level output to be maintained even when input signal levels vary widely. Especially important in the following voice frequency applications: toll conference grouping, loudspeaking telephone, party line, PBX tie line, and supervisory monitoring systems. Power Required: 25 ma @ 24 v DC.

461A POWER AMPLIFIER, CLASS B PUSH-PULL — Provides two watts output power to drive monitoring loudspeaker or a distribution network routing information to several locations. Input Impedance: 600 ohms nominal. Load Impedance: 8 ohms. Frequency Response: —1 db at 100 cps and 6000 cps relative to 1000 cps. Power Supply: 20-26 volts DC battery or rectified AC with total ripple contents below 2 mv and regulation better than 5% for a current change of 250 mas. Power Required: 250 mas for 2 watts output, 20 mas no input.

ALTEC "Quick-Fix" TERMINATION BAY

Typical integrated communication relaying system with custom configuration of ALTEC plug-in amplifiers, equalizers, transformers. Also contains transmit and receive jacks, power supplies, writing shelf, and wire chief's test panel. Capacity for 25 or 50 separate transmit and receive channels functioning on four-wire basis.

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Let our "Revenue Men" show you

THE EXTRAS THAT GO WITH INCREASED SALES!

Take a man like
Jack Mixer...

Jack is one of our "Revenue Men" in Long Beach, California.

When he graduated from high school in 1942, Jack was ready and eager to go on to college. But, as happened to many plans in those hectic years, Jack's college career had to be postponed.

Jack joined the U. S. Navy, and served six years' continuous sea duty in the Pacific theater as a radioman.

In 1948, Jack Mixer returned ashore in pursuit of his postponed college education. While earning his degree, he took on a load of spare-time work to gain business experience and pay for half of his college expenses.

After graduation in 1952, Jack joined General Telephone as a sales representative in Long Beach. In 1956, he was promoted to Sales Supervisor of a Long Beach unit.

In January of this year, Jack and his wife presented their eight-year-old son with a baby brother.

Jack Mixer is typical of the community-minded "Revenue Men" who work for General Telephone Directory Company—and for you.

You get more than extra sales when you put one of our "Revenue Men" to work on your directory.

His manners, his methods will be a positive credit to your company. He'll be welcomed by your advertisers.

He'll work together with you to produce a book you can be proud of. A directory with complete Yellow Pages service—showing the public where to go for all kinds of purchases, rentals and services. A directory with maximum accuracy, maximum revenue.

And you won't have a worry in the world. Selling, publishing and printing are all done to perfection as part of our Complete Directory Service Plan.

Want to know more about it? A phone call or letter to our nearest office will bring a representative on the double.

GENERAL TELEPHONE DIRECTORY COMPANY

1800 Oakton Boulevard
Des Plaines, Illinois
VAnderbilt 7-6111

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